TANDBERG DATA

StorageLoader™

INSTALLATION AND USER MANUAL

TANDBERG DATA ASA
P.O. Box 134 Kjelsås
N-0411 OSLO, NORWAY
Phone + 47 22 18 90 90
Telefax + 47 22 18 95 50
www.tandberg.com

© Tandberg Data ASA

Part No. 433061-04
May 2006

Related publications available from Tandberg Data ASA:

Part No.	Title
432980	Tandberg Data StorageLoader SCSI Interface Functional Specifications.
433060	Tandberg Data StorageLoader Quick Installation Guide

This publication may describe designs for which patents are granted or pending. By publishing this information, Tandberg Data ASA conveys no license under any patent or any other rights.
Every effort has been made to avoid errors in text and diagrams. However, Tandberg Data ASA assumes no responsibility for any errors, which may appear in this publication.
It is the policy of Tandberg Data ASA to improve products as new techniques and components become available. Tandberg Data ASA therefore reserves the right to change specifications at any time.
We would appreciate any comments on this publication.

Table of Contents

1. About This Manual 5

2. General Information 7

2.1 Models 8
2.1.1 Capacity 8
2.1.2 Data Transfer Rates 8
2.2 Product Description 8
2.2.1 Front Panel 9
2.2.2 Internal Components 11
2.2.3 Rear Panel 13

3. Installation 14

3.1 Performing the Installation 14

4. Operation and Configuration 26

4.1 System Power-On 26
4.2 Front Panel Display Modes 29
4.2.1 Menus 29
4.2.2 Dialogs 31
4.2.3 Messages 33
4.2.4 Status and Information 33
4.3 Main Menu 34
4.4 Setup Menu 35
4.4.1 StorageLoader setup 35
4.4.2 SCSI Setup 36
4.4.3 Remote Management setup 36
4.5 View Data Menu 37
4.5.1 StorageLoader Info 37
4.5.2 Drive Info 38
4.5.3 Remote Management Info 39
4.5.4 Statistics 39
4.6 Utilities Menu 39
4.6.1 The Maintenance Menus 40
4.6.2 The Diagnostics Menu 40
4.6.3 Set Password 41
4.7 Cartridge Handling 41
4.7.1 Cartridge Slot Numbers 41
4.7.2 Moving Cartridges to and from the Drive 41
4.8 Magazine Handling 42
4.8.1 Removing the Magazine from the Unit 42
4.8.2 Inserting Cartridges into the Magazine 44
4.8.3 Removing Cartridges from the Magazine 44
4.8.4 Inserting a Magazine into the Unit 45
4.8.5 Manual/Emergency Release of Magazines 46
4.9 Standby Functionality 46

5. Remote Management 48

5.1 Remote management configuration....48
5.1.1 Quick start guide....48
5.1.2 Enabling the RMI without rebooting....48
5.2 Remote management web pages....49
5.2.1 Information Boxes....49
5.2.2 StorageLoader Start Page....50
5.2.3 Status Page....51
5.2.4 Settings Pages....53
5.2.5 Command Page....54
5.2.6 Maintenance Pages....54

6. Maintenance....55

6.1 Using the Cleaning Cartridge....55
6.1.1 Running an Installed Cleaning Cartridge....55
6.1.2 Removing the Cleaning Cartridge....56
6.2 Installing Firmware Upgrades....57
6.2.1 Firmware Upgrade via SCSI....57
6.2.2 Possible Upgrade Problems....58
6.3 Embedded Diagnostics....58
6.4 Reinstalling the Transport Lock....58
6.4.1 Transport Lock Installation Procedure....59
6.5 Field Replaceable Units (FRUs)....59
6.5.1 FRU Drive Tray Assy DLT VS160 SCSI....60
6.5.2 FRU Drive Tray Assy 420LTO....63
6.5.3 FRU Power Supply....65
6.5.4 FRU Fan....66
6.5.5 FRU Magazine....68
6.5.6 FRU Filter....69

7. Troubleshooting....71

7.1 How to Take Memory Dumps of the Loader....71
7.2 How to Take Memory Dumps of the Drive....71
7.3 Hardware checking....71
7.4 Software checking....72
7.5 Verifying Recent Changes....72
7.6 Trouble shooting matrix....73
7.7 The Error Screen....80
7.8 Error Codes....82

Appendix A – Specifications....85

A.1 Mechanical Dimensions and Weight....85
A.2 Power Requirements....86
A.3 Vibration Specifications....89
A.4 Mechanical Shock Specifications....90
A.5 Drop....90
A.6 Climatic Specifications....90
A.7 Noise Specification....91
A.8 Product Reliability....91

Appendix B – Spare parts/Accessories....91

Table of Figures

Figure 2.1 Overview of Tandberg Data StorageLoader 1U ... 7
Table 2-1 Data Storage Capacity 8
Table 2-2 Data Transfer Rates 8
Figure 2.2 Front panel of the StorageLoader 9
Figure 2.3 Internal components of the StorageLoader 11
Figure 2.4 Cartridge magazines..... 12
Figure 2.5 Rear panel of the StorageLoader 13
Figure 3.1 Rack Mounting kit 16
Figure 3.2 Rack mount rail 17
Figure 3.3 Mounting the Rack mounting kit to a rack..... 18
Figure 3.4 Rack mounting kit mounted in rack 18
Figure 3.5 Slide the StorageLoader in from the front..... 19
Figure 3.6 Fasten the front of the StorageLoader to the rack19
Figure 3.7 Fasten the rear of the StorageLoader to the rails.19
Figure 3.8 Main Power switch, fuse holder and power cord connection..... 20
Figure 3.9 Robotics lock marked with red plastic tab 21
Figure 3.10 SCSI cable and SCSI terminator connection ... 23
Figure 3.11 Positioning of bar code label for LTO cartridges.24
Figure 3.12 Positioning of bar code label for DLT cartridges.25
Figure 4.1 Power-on Screen 26
Figure 4.2 Snapshot while running Inventory 26
Figure 4.3 The Default screen 27
Table 4-1 Robot Operation Statuses 27
Table 4-2 Drive Operation Statuses 28
Figure 4.4 Standard Menu Layout..... 29
Figure 4.5 The Complete Menu Tree 30
Figure 4.6 Standard Dialog Layout..... 31
Figure 4.7 Dialog layout, entering discrete values..... 31
Figure 4.8 Slot dialog layout. 32
Figure 4.9 Predefined options, showed one at the time..... 32
Figure 4.10 A default screen. 33
Figure 4.11 Load to Drive..... 41
Figure 4.12 Load to Drive..... 42
Figure 4.13 Empty Drive Message 42
Figure 4.14 Removing magazine 43
Figure 4.15 Magazine eject..... 43
Figure 4.16 Removing the magazine from the loader..... 44
Figure 4.17 Gently push the cartridge into the magazine slot44
Figure 4.18 Push the release knob towards the cartridge to eject 45
Figure 4.19 Cartridge position after manual release from magazine slot..... 45
Figure 4.20 Push magazine until it clicks into place 45
Figure 4.21 Pointing out hole used to insert release tool ... 46
Figure 4.22 Magazine release tool in use 46
Figure 5.1 Navigation Menu..... 49
Figure 5.2 Remote Management Start Page 51

Figure 5.3 Remote Management Status Page 52
Figure 5.4 Remote Management Command Page 54
Figure 6.1 Transport lock marked with red plastic tab 58
Figure 6.2 Field Replaceable Units 60
Figure 6.3 Replacing the tape drive 61
Figure 6.4 Rear of the tape drive..... 61
Figure 6.5 Releasing the tape drive 61
Figure 6.6 Guide cartridge mounting..... 62
Figure 6.7 Correct position of Guide cartridge mounting ... 62
Figure 6.8 Replacing the tape drive 63
Figure 6.9 Rear of the tape drive..... 64
Figure 6.10 Releasing the tape drive..... 64
Figure 6.11 Exchanging a defective power supply 65
Figure 6.12 Removing the fixing screw..... 65
Figure 6.13 Fan power..... 66
Figure 6.14 Removing the back panel cover plate 66
Figure 6.15 Removing the fan..... 67
Figure 6.16 Notch in chassis for fan cable..... 67
Figure 6.17 Replacing dust filter..... 69
Figure 7.1 Error Code Page..... 80
Figure 7.2 Example of detailed information..... 81
Figure 7.3 Example of further detailed information 81
Figure 7.4 Example of action 81
Figure 7.5 Warning message concerning reboot 81
Table A - 1 StorageLoader Mechanical Dimensions and Weight 85
Table A - 2 StorageLoader Power Requirements..... 86
Table A - 3 StorageLoader sine sweep levels 89
Table A - 4 StorageLoader random vibration levels..... 89
Table A - 5 StorageLoader mechanical shock levels 90
Table A - 6 StorageLoader drop test..... 90
Table A - 7 StorageLoader temperature specification 90
Table A - 8 StorageLoader humidity specification 91
Table A - 9 StorageLoader altitude specification..... 91
Table A - 10 StorageLoader noise specification..... 91
Table B - 1 List of spare parts and accessories..... 92

Table of Tables

Table 2-1 Data Storage Capacity..... 8
Table 2-2 Data Transfer Rates 8
Table 4-1 Robot Operation Status 27
Table 4-2 Drive Operation Status 28

Table A-1 StorageLoader Mechanical Dimensions and Weight 85
Table A-2 StorageLoader Power Requirements..... 86
Table A-3 StorageLoader sine sweep levels 89
Table A-4 StorageLoader random vibration levels..... 89
Table A-5 StorageLoader mechanical shock levels 90

Table A-6 StorageLoader drop test 90
Table A-7 StorageLoader temperature specification 90
Table A-8 StorageLoader humidity specification 91
Table A-9 StorageLoader altitude specification 91
Table A-10 StorageLoader noise specification 91

Table B-1 List of spare parts and accessories 92

1. About This Manual

This manual describes how to install and use the Tandberg Data StorageLoader for 420LTO and DLT VS160 tape drives. It is intended for use by anyone who would install, use and maintain the device.

Chapter 2: *General Information* gives a product description of the StorageLoader.

Chapter 3: *Installation* describes how to install the device.

Chapter 4: *Operating and Configuration* describes how to use the local interface, how to configures the device, and how to handle the cartridges and magazines.

Chapter 5: *Remote Management* describes the functionality of the Remote Management via the Ethernet.

Chapter 6: *Maintenance* describes cleaning and upgrading procedures, and how to prepare the StorageLoader for shipping.

Chapter 7: *Troubleshooting* lists possible areas to investigate if you are having problems with the StorageLoader.

AppendixA: *Specifications* lists the specification data for the Tandberg Data StorageLoader 1U.

Appendix B: *Spare parts and Accessories* lists all accessories and spare parts with part number.

2. General Information

Tandberg Data **Storage**Loader™ is a compact tape cartridge loader designed for secure, reliable, unattended system backup. The loader can be mounted in a 19" rack or used as a tabletop unit. Its height is 1U.

The loader is equipped with a Tandberg DLT VS160, 220LTO or 420LTO tape drive and has room for 8 cartridges in two 4-cartridge magazines.

Figure 2.1 Overview of Tandberg Data StorageLoader 1U

The entire system is under host control via an industry-standard SCSI interface. Its robotic tape handling is both rugged and simple for utmost reliability

The key features of the StorageLoader include:

- Two removable cartridge magazines, each with space for four cartridges
- Integrated Bar Code Reader (Optional on some models)
- Magazine release under system control
- Low Voltage Differential (LVD) / Single-Ended (SE) SCSI Interface
- On-board Diagnostics
- Remote management
- Operators interface with front panel display and four control buttons
- Standby functionality
- Replaceable dust filters
- Tape drive, magazines, power supply and fans are Field Replaceable Units (FRUs)

***** IMPORTANT *****

Review the **READ ME FIRST** caution at the beginning of Chapter. 3 before you power up the unit for the first time.

Models. For additional specification information for this model, refer to Appendix A.

2.1.1 Capacity

StorageLoader Model	Cartridge Capacity (Native)	Cartridge Capacity (Comp 2:1)	Magazine Capacity (Native)	Magazine Capacity (Comp 2:1)
Tandberg StorageLoader LTO1	100GB	200GB	800 GB	1.6TB
Tandberg StorageLoader LTO2	200GB	400GB	1.6TB	3.2TB
Tandberg StorageLoader VS160	80GB	160GB	640GB	1.28TB

Table 2-1 Data Storage Capacity

2.1.2 Data Transfer Rates

StorageLoader Model	Maximum Sustained Rate, Native	Maximum Sustained Rate, Compressed
Tandberg StorageLoader LTO1	16MB/s 57.6GB/hr	32MB/s 115.2GB/hr
Tandberg StorageLoader LTO2	24MB/s 86.4GB/hr	48MB/s 172.8GB/hr
Tandberg StorageLoader VS160	8MB/s 28.8GB/hr	16MB/s 57.6GB/hr

Table 2-2 Data Transfer Rates

2.2 Product Description

The StorageLoader has several features designed to increase the ease of use and utility of the product, such as:

- Two removable magazines allow for easy management of data sets or archival storage. For the StorageLoader each magazine has room for four cartridges.
- A menu-driven operator control panel interface with backlit LCD provides easy control for configuration and diagnostic activities.

- An Ethernet connection allows for management by an operator with a standard web browser on a remote computer. The remote operator can do most of the operations that can be done through the front panel, such as monitoring the loader's status and downloading statistical and diagnostic information.

For information on the installed tape drive; see the tape drive manuals referred to in chapter 1.

2.2.1 Front Panel

The Front Panel includes the User Control Panel with LCD display, four Control Buttons, two LED indicators and a Standby switch. The bezels of the two magazines are also visible from the front.

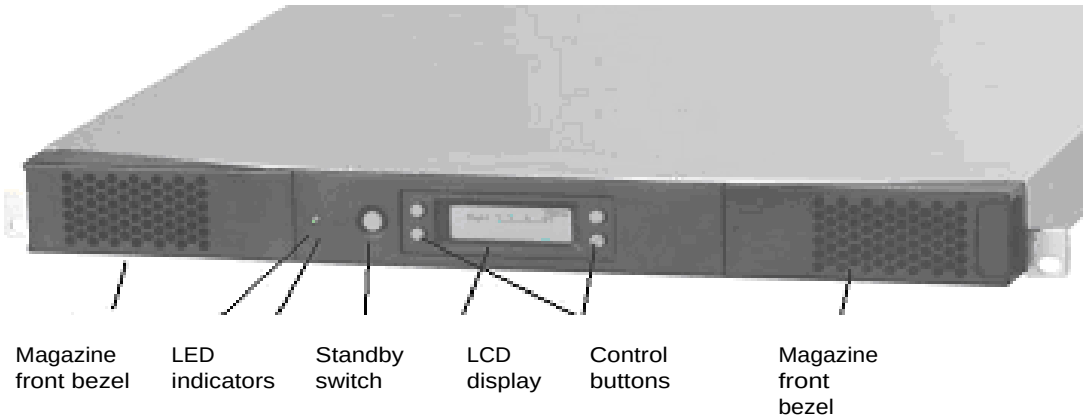


Figure 2.2 Front panel of the StorageLoader

LCD – liquid crystal display

The display is a backlit 122 x 32, dot-matrix graphical display that can show four lines of 20 characters.

In various modes of operation, the display panel screens and control buttons allow you to do the following:

- Enter settings for StorageLoader configuration
- Issue operational commands
- View StorageLoader status and information
- Test StorageLoader functionality

Control Buttons

The labels for the four control buttons are displayed in the corners of the LCD. All buttons have "soft labeling" for different modes of operation (i.e., the functions and labels of the buttons change during different activities). The actual soft label for each button for

any activity is always visible on the display.

LED Indicators

The two LED indicators are green and amber. They indicate the StorageLoader activity as follows:

- Green LED on: The StorageLoader is either running or ready for operation.
- Green LED blinking: Short blinks followed by long intervals indicate that the loader is in low power standby mode.
- Amber LED on: Fault LED, the StorageLoader has encountered an electrical or mechanical failure.
- Both LED's off: The StorageLoader is offline. This is the case while the loader is initializing, after power-on, and when a magazine is removed.

Standby Switch

A switch on the front panel provides a Loader Standby. If the switch is pushed when the loader is active, the loader will complete the current operation and go off line and enter standby mode, see more details in chapter 4.9, Standby Functionality.

Magazine Front Bezel

The front bezel of the magazines is visible from the front. All magazine handling is described in detail in chapter 4.8, Magazine Handling.

Internal Components

The StorageLoader features the main internal components shown in the figure below.

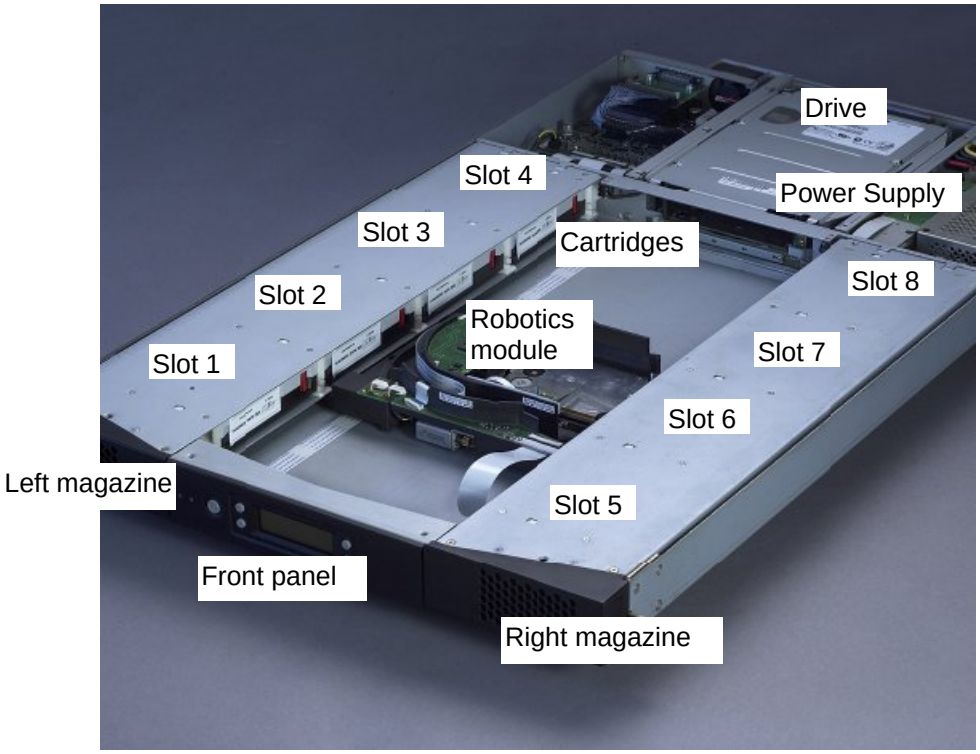


Figure 2.3 Internal components of the StorageLoader

Tape Drive

The StorageLoader is equipped with one tape drive, which is located in the centre in the back of the loader. The drive is a field-replaceable unit (FRU) that can be removed/replaced while the loader is mounted in a rack. See section 6.5.1, FRU Drive Tray Assy DLT VS160 SCSI, section 6.5.2, FRU Drive Tray Assy 220LTO and 420LTO.

Robotics Module

The robotic cartridge handling mechanism moves cartridges between the cartridge slots in the two magazines and the tape drive.

Barcode Reader

The barcode reader is standard and an optional part on some models. When mounted, it is integrated in the Robotics Module. Please note that StorageLoader specific bar code labels need to be used to achieve correct operation of the bar code reader.

Cartridge Magazines

There are two removable magazines (FRUs), each holding four tape cartridges, see figure 2.4. The magazine includes design features to ensure that cartridges are always inserted correctly and stay securely seated. All magazine handling is described in detail in section 4.8, Magazine Handling.

The Cartridge Slots in the magazines are numbered as shown in figure 2.3

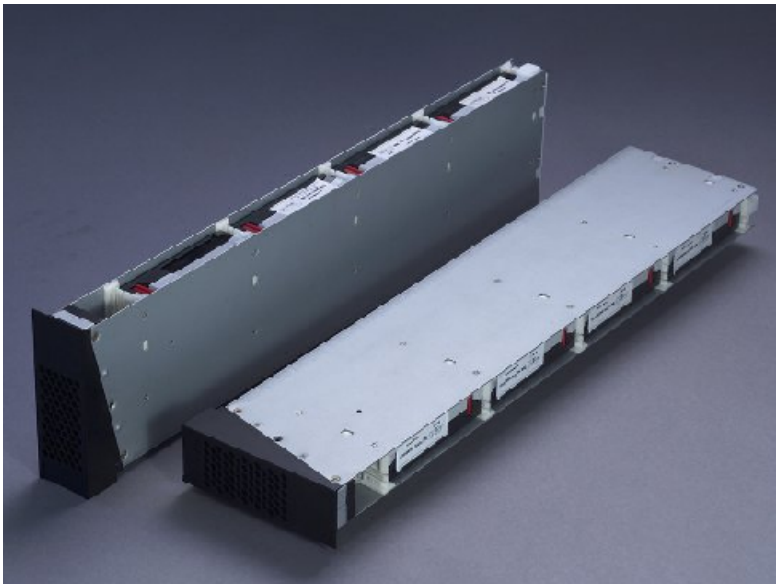


Figure 2.4 Cartridge magazines

Power Supply

The power supply regulates the electrical power supplied to the device. It is easily removable (FRU) for quick field service; see section 6.5.3, FRU Power Supply.

2.2.2 Rear Panel

The figure below shows the rear panel of the StorageLoader.

Main Power switch | Fuse | Power cord connection | Fan | Back panel cover plate | Fan | SCSI connectors | Ethernet port

Figure 2.5 Rear panel of the StorageLoader

Two Integrated Cooling Fans

The rear panel contains two forced-air cooling fans, which draw air inward through the front and expel it out in the back. The fans will start whenever the drive is operating or when the internal temperature in the StorageLoader gets too high. The cooling fans are field replaceable units, see section 6.5.4, FRU Fan.

Main Power Switch/ Fuse/Power cord connection

The main power switch is found on the rear of the loader on the power supply bracket. The power switch, the fuse holder (with a 250V 2A (H) fuse) and the AC power cord connection are combined in one common unit.

SCSI Interface Connectors

The StorageLoader has two shielded 68-pin VHDCI SCSI connectors on the rear panel. The connectors are used for connecting the tape drive and the StorageLoader to a SCSI bus. These connectors can link to the following:

- A shielded male VHDCI SCSI cable
- A shielded male VHDCI SCSI terminator.

Ethernet Port

This port is for the Remote Management system and allows you to connect the StorageLoader to a 10/100 BaseT Ethernet network.

Back Panel Cover Plate

Removing the Back Panel Cover Plate gives you access to all the field-replaceable units located at the back of the StorageLoader.

3. Installation

This chapter provides step-by-step instructions on how to properly prepare and install the Tandberg Data StorageLoader.

READ ME FIRST

CAUTION! !

YOU MUST REMOVE THE

ROBOT TRANSPORT LOCK
WHEN POWERING UP THE UNIT FOR THE FIRST TIME
OR IT WILL NOT OPERATE.

SEE THE PROCEDURE ON THE FOLLOWING PAGES.

3.1 Performing the Installation

To install the StorageLoader, complete the following steps.

Step 1. Unpacking the StorageLoader

Carefully unpack the unit from the shipping container. Save the container and packing materials in case you need to transport the StorageLoader in the future. The packaging is specifically designed for the loader to ensure it is not damaged during transportation.

Review the contents of the shipping container to be sure that all parts were included in the shipment. A standard package for the StorageLoader consists of the following items:

- A factory-assembled StorageLoader unit containing two cartridge magazines.
- A Standard Accessory Kit containing:
  - 1 The Tandberg Data StorageLoader CD containing all manuals
  - 1 Printed copy of the Quick Installation Guide
  - 1 Warranty/Registration Card
  - Rack Mount Hardware Kit

- 2 Line Power Cords: one for USA/Japan and one for European power outlets
- 1 VHDCI SCSI Interface Cable
- 1 68-pin VHDCI LVD/SE SCSI Terminator.
- 1 Ethernet cable
- Tool for Emergency Magazine Release
- 30 StorageLoader specific Bar code labels

There will be variations of this list. Please also refer to your Quick Installation guide shipped with the StorageLoader.

Note: The StorageLoader contains no cartridges before shipment.

Step 2. Installing the StorageLoader in a Rack

The StorageLoader is designed for use in 19" rack system using 1U of rack space. The length of the power cord and the SCSI cable may restrict the placement.

Attention: The StorageLoader is designed to operate in a horizontal position. Do not attempt to operate the StorageLoader in any other position than horizontally. Also make sure that:

- The airflow around the front and back of the StorageLoader is not obstructed.
- There is a minimum of 60cm free space in front of the unit to allow the operator to safely remove the magazines.
- The display and operator controls are easily accessed.
- The StorageLoader is away from the floor , and in a clean environment with temperature within specification, see Appendix A.

The Rack Mounting Kit includes the following items:

- Rail Left Assembly
- Rail Right Assembly
- Screw M6x12 (6 pieces)
- Screw M5x8 (2 pieces)

Recommended mounting tools:

- Folding rule or tape measure
- Screwdriver
- 7 mm open-end wrench

Note: The rails are mounted to the loader during transportation. Before mounting the rails into the rack, dismount the rails from the loader and remove the spacers between the rails and the loader.

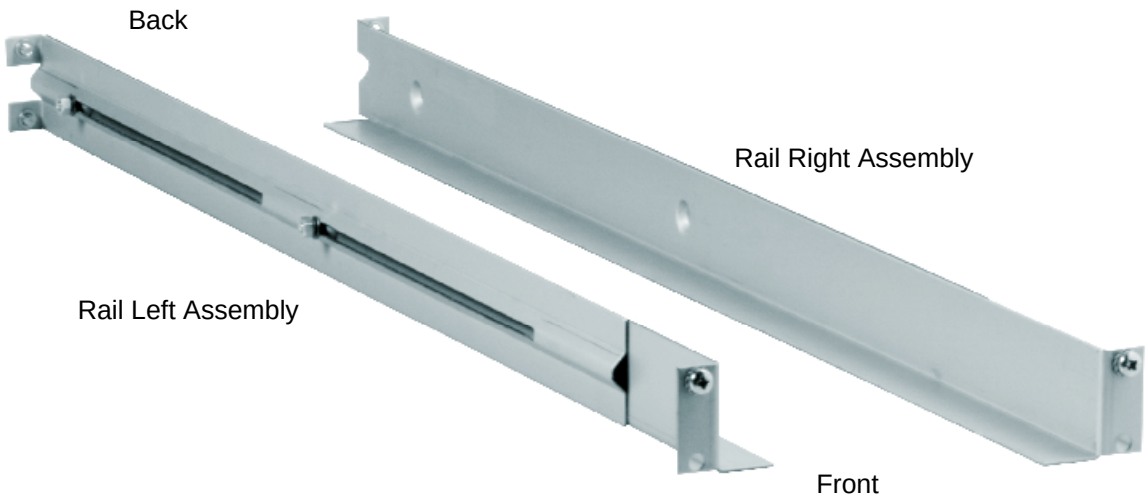


Figure 3.1 Rack Mounting kit

Installing the Rack Mounting Kit

- Determine the proper position of the rails in the rack.

Caution: Consider rack stability when deciding where to place the StorageLoader, hazardous conditions can be the result of uneven mechanical loading of a rack.

StorageLoader 1U uses 1U of vertical rack space. The rails must be installed in a full U position (The bottom of the rails must be aligned with the bottom of a U), see figure 3.2.

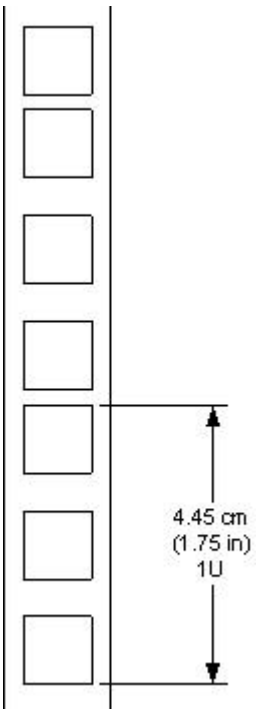


Figure 3.2 Rack mount rail

Installing the "Rail Left Assembly"

1. Measure the length between the rear rack mount rails and the front rack mount rails. If the measurement is shorter than the StorageLoader, move the two sets of screws M4x12, washers and nuts shown in Figure 3.3.

2. Adjust the "Rail Left Assembly" to fit the measurement in step 1.

3. Use a 7 mm open-end wrench together with the screwdriver to tighten the two M4x12 screws to fix the rail length.
   Note: *Using more than two screws will increase the stability of the Rack Mounting Kit.*

4. Place the "Rail Left Assembly" on the left side of the rack, between the rear rack mount rail and the front rack mount rail.

5. Mount the "Rail Left Assembly" at desired height using one M6x12 screw in front (upper hole in rail only) and two M6x12 screws at the backside. See figure 3.4.

Installing the "Rail Right Assembly"

Follow the instruction for left side only using the "Rail Right Assembly" on the right side of the rack.

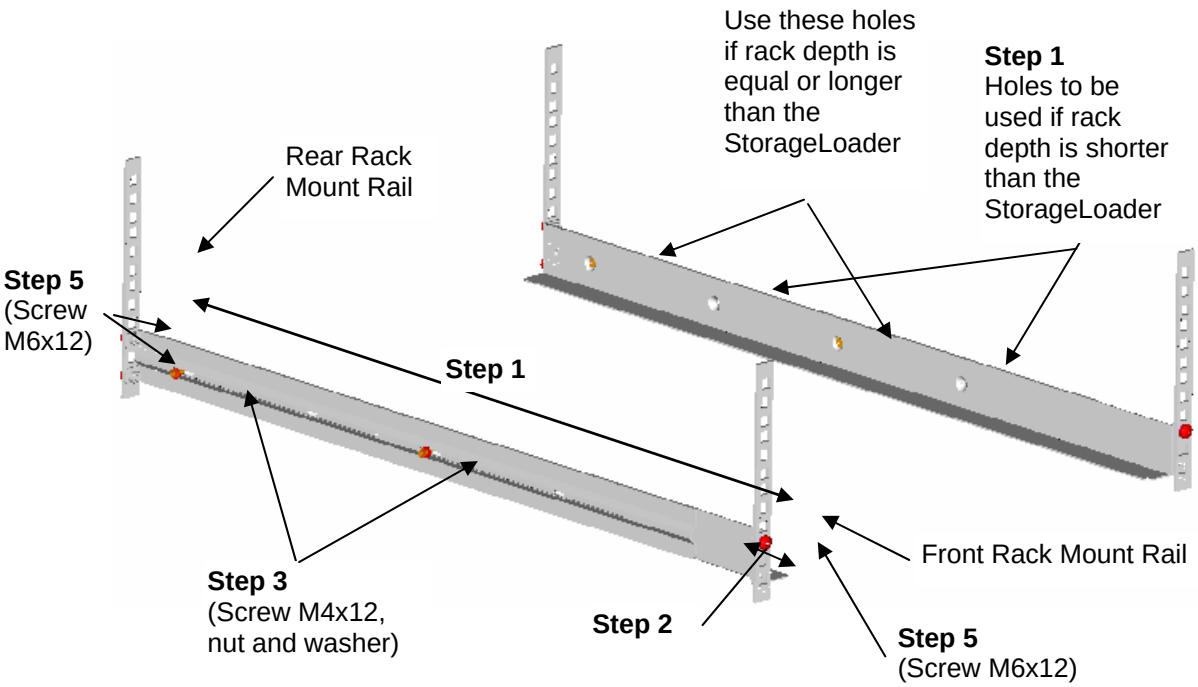

Use these holes if rack depth is equal or longer than the StorageLoader
Step 1
Holes to be used if rack depth is shorter than the StorageLoader
Rear Rack Mount Rail
Step 5
(Screw M6x12)
Step 1
Step 3
(Screw M4x12, nut and washer)
Step 2
Front Rack Mount Rail
Step 5
(Screw M6x12)

Figure 3.3 Mounting the Rack mounting kit to a rack

Figure 3.4 shows step 5 in the description:

Rack mounting kit mounted in rack with one screw M6x12 in upper hole on both left and right side.

On the rear side two screws must be used on both left and right side.

Totally six screws are used to install the "rack mounting kit" to the rack.

Figure 3.4 Rack mounting kit mounted in rack

Mounting the StorageLoader to the Rack

Make sure that all the screws in the Rack Mounting Kit are tightened properly before installing the StorageLoader in the rack.

Slide the StorageLoader on the rails from the front of the rack, as shown in figure 3.5. Then fix the StorageLoader using one M6x12 screw in front of the rack on both left and right side (see figure 3.6) and one M5x8 on the backside of the Rack Mounting Kit on both left and right side (see figure 3.7).

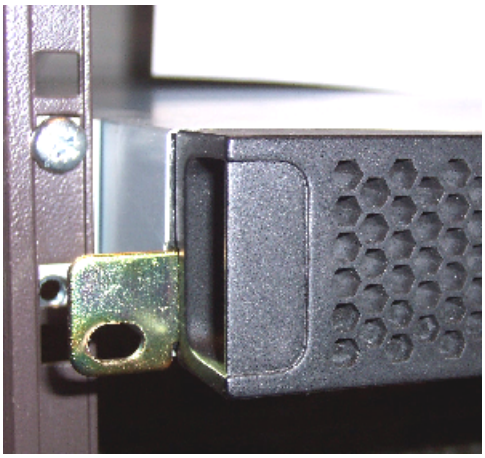


Figure 3.5 Slide the StorageLoader in from the front

Figure 3.6 Fasten the front of the StorageLoader to the rack

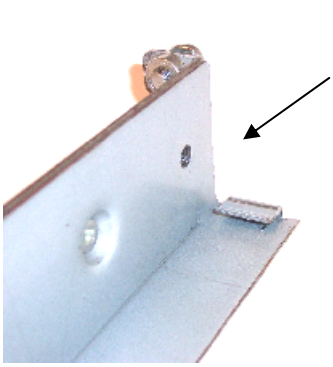


Figure 3.7 Fasten the rear of the StorageLoader to the rails.

How to dismount the StorageLoader from the rack

Make sure that you have disconnected all the cables before you start dismounting the StorageLoader from the rack.

Unscrew the M5x8 screws at the back of the rack mounting kit. (See figure 3.7)

Unscrew the M6x12 screw at the front of the rack. Note that you only unscrew the lowest screw. (See figures 3.5 and 3.6)

Slide the StorageLoader gently out of the rack. Note that the StorageLoader's weight is 14.6kg!

Step 3. Connecting Power Cable

The StorageLoader is offered both with AC and DC connection.

- DC connection.

This version is offered with special connector and -48 VDC voltage. This is described in appendix. A2. Please note grounding requirements and special connector.

AC connection

Before connecting the StorageLoader to your host computer system you should run the self-diagnostic of the unit. This preparation requires power to the StorageLoader. Go through the following steps to perform this test:

1. Use the power cables from the accessories included in the shipment. Make sure you select the power cord suited for your power system.
2. Plug the power cable into the rear of the StorageLoader (see figure 3.8). Plug the other end of the cable into a properly grounded electrical outlet.

Note: *Reliable earthing depends on earthing in the AC electrical outlet, in which the StorageLoader's power cable is connected. Adding the StorageLoader to an existing rack installation can cause a leaking current fault condition because of the summation of the leaking currents. For security, a 250V 2A (H) fuse is located near the power switch.*

3. Turn on the StorageLoader by switching the Power Switch to "1". If the transport lock is present the loader will detect this and instruct the user to remove it, see next step.

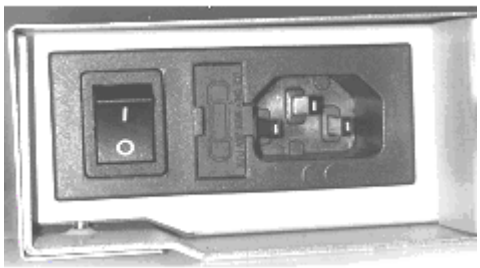


Figure 3.8 Main Power switch, fuse holder and power cord connection

Step 4. Removing the Transport Lock

The robot mechanism is protected from damage during shipment with a screw holding the robotics in a locked position.

This locking screw is marked with a red plastic tab protruding between the right magazine and the front panel assembly.

This locking screw must be removed before the StorageLoader can operate normally.

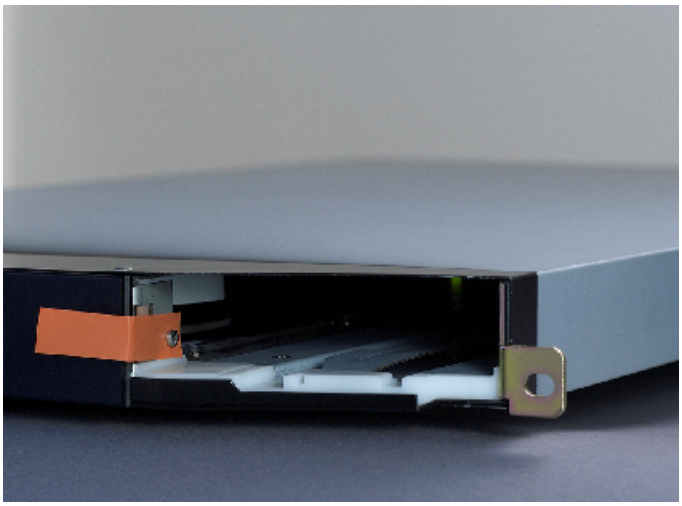


Figure 3.9 Robotics lock marked with red plastic tab

The locking screw will be detected when the StorageLoader is powered on. The display will show a message indicating the locking screw has been detected. The display will instruct the user to remove the magazine to gain access to the locking screw. Remove the screw and reinsert the magazine. The loader will now continue its power on sequence, see next step.

For manual/emergency release of the magazine, see section 4.8.5.

Note*: Keep the screw in a safe place. You will need it to lock the robot if you need to return your StorageLoader to the supplier for service or repair.*

Important: *The warranty does not cover damage to the loader, shipped without the locking screw properly installed. See section 6.4, Reinstalling the Transport Lock , on how to re-install the transport lock.*

Step 5. Running Power-On Selftest

After the transport lock is removed, the loader will continue running it's power-on selftest and doing an inventory of its cartridges.

The word Idle and the cartridge map will appear on the default display screen. If the self-diagnostics and the inventory sequence are successfully completed, the green LED will illuminate. The StorageLoader is now ready to be installed in the system.

If a problem occurs during the power-on sequence, the StorageLoader will display an error message on the display. Refer to chapter 4.2 and 7, to learn the procedures for resolving the problem.

Step 6. Setting the SCSI Address

The SCSI address is a unique address that identifies the unit connected to the SCSI bus. The StorageLoader uses two SCSI addresses or Id's. One is for the loader robotics controller and the other is for the tape drive. The SCSI addresses can be configured through the operator buttons and the display on the front panel. In most cases the default addresses can be used. The default SCSI address for the StorageLoader robotics is 4 and the tape drive has SCSI address set to 5.

To set the SCSI addresses for the StorageLoader and the built in tape drive, refer to section 4.4.2, SCSI Setup for more information. You may also wish to reserve a magazine slot for a cleaning cartridge, and set a security password at this time. Once some settings are changed, the StorageLoader and the drive may, if required, automatically reboot.

Step 7. Connecting the SCSI Bus Cable

Guidelines before connecting the SCSI cable:

A) Before the SCSI bus cable is connected to the StorageLoader, turn the StorageLoader main power switch off.

B) Make sure that your host system is in a state were a new SCSI device can be safely connected to the SCSI bus.

C) Do not exceed SCSI bus length restrictions.

1. Add the length of all external and internal SCSI cables on the bus
2. Add 80 cm (31.5 inch) for the internal cable length in the StorageLoader.
3. The maximum allowed length of an LVD SCSI bus is 12 m (39 ft) if the number of SCSI devices exceeds two.
4. For an SE SCSI bus, be very careful regarding bus length. The normal combination has a SE bus transfer speed of 160 Mbyte/s with a maximum bus length of 3 m (9.8ft) and up to 4 SCSI devices connected. If your SE system operates with a different transfer speed or has more than 4 SCSI devices, we refer to the actual SCSI standard for complete bus length restrictions.

D) Before the StorageLoader is powered on and the system is restarted, make sure that the SCSI bus is properly terminated. If the StorageLoader terminates the SCSI bus, it is recommended to connect the terminator from the accessory kit box on the lower SCSI connector on the back plane. See figure 3.10.

To connect the SCSI bus cable:

1. On the rear of the StorageLoader, attach the device connector of the SCSI cable to the upper SCSI connector, see figure 3.10.
2. Secure the cable with the thumbscrews on the connector.
3. Connect the other end of the SCSI cable to the appropriate SCSI adapter on your system and fasten it with the thumbscrews.
4. If the StorageLoader is the last device on the SCSI bus, install a SCSI bus terminator to the free SCSI connector on the StorageLoader. Make sure that the terminator is of the correct type for your SCSI system.
5. It is possible to daisy chain several SCSI devices on the SCSI bus. If you do, the terminator must be connected to the last device on the bus. Note that there are limitations to the SCSI cable length.

Figure 3.10 SCSI cable and SCSI terminator connection

Step 8. Connecting the Ethernet Connector

To connect the StorageLoader to the Ethernet, use the provided cable from the accessory kit box.

1. Insert one end of the cable into the StorageLoader Ethernet port. Push until it snaps into place. The open port in figure 3.10 is for Ethernet connection.

2. Connect the other end to a normal 10/100 BaseT Ethernet outlet.

The Ethernet-based Remote management system is described in chapter 5, Remote Management.

Step 9. Restarting Your System

It is recommended that all external SCSI devices, including the StorageLoader are powered on before the computer system is re-started. Turn on the StorageLoader first and wait while the StorageLoader runs a power up Self-test (like in step 5 above). When the display reports that the StorageLoader is in the "Idle" state and the green LED is on, the StorageLoader is ready. Then turn on the Server/PC and the system is ready for further configuration and operation (described in chapter 4, Operation and Configuration).

Note: The tape drive needs up to 40 seconds from power on until it's active on the SCSI bus. It is recommended to turn on the power at least 40 seconds before the computer system is started.

Step 10. BCR: Labelling of cartridges

If your loader is equipped with a bar code reader and you want to use this functionality, you need to attach bar code labels to the cartridges.

Note: You need to use StorageLoader specific bar code labels to ensure reliable functionality of the bar code reader. The bar code labels for LTO and DLT cartridges differ.

Cartridge labels **must** be oriented on the cartridges as shown in the figures below for LTO cartridges and DLT cartridges respectively.

Figure 3.11 Positioning of bar code label for LTO cartridges.

Figure 3.12 Positioning of bar code label for DLT cartridges.

4. Operation and Configuration

The Local User Interface (LUI) consists of a small LCD panel capable of displaying four lines of 20 characters each, and four control buttons, one near each corner of the display. The buttons have soft labels in the corners of the display. The figure below shows the power-on screen on the panel.

Figure 4.1 Power-on Screen

4.1 System Power-On

With mechanical installation and electrical connection complete, turn on the main power switch. At power-on, for the first few seconds, the unit performs a sequence of diagnostic tests called Power-On Self Tests (POST). POST also includes a loop back test of the robot cabling. As the tests are completed, the control panel displays a sign-on message, see figure 4.1.

After successful completion of the POST sequence, the loader will respond to SCSI selections. Then the system starts a series of initialization functions, a process that consists of robot calibration operation and cartridge inventory of magazines and drive. If a barcode reader is installed and enabled, the barcode labels on the cartridges will be read when running inventory.

During these operations the loader will continuously show the map status on the screen, see figure 4.2. The status of all magazine slots and the drive are initially unknown, and a '?' is displayed for each slot. As the robot searches the magazine slots for cartridges during Inventory, the display is updated.

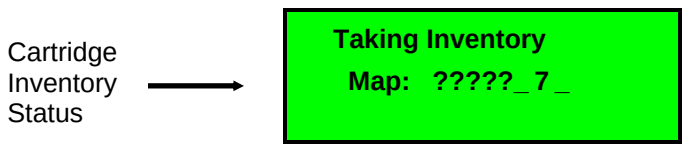


Figure 4.2 Snapshot while running Inventory

Once the unit has completed the initialization processes, the

Default screen, see figure 4.3 appears and the loader is ready for SCSI commands.

The Map of the cartridges has the following symbols:

1. A "?" when status is unknown and Inventory is still running.
2. A number indicates a slot occupied by a cartridge (figure 2.3 shows how the cartridge slots are numbered in the magazines)
3. Underscore line indicates an empty slot
4. 'C' indicates that a Cleaning Cartridge occupies the slot.

The line below the map on the default screen gives the drive status. The drive status displayed is drive dependent.

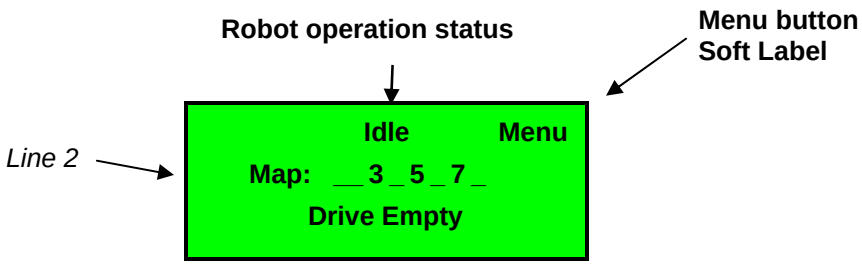


Figure 4.3 The Default screen

The robot operation status has the following options:

1	Idle	The loader is idle
2	Fetching	The loader is moving a cartridge from a magazine slot or from the drive to the robot.
3	Stowing	The loader is moving a cartridge from the robot to a magazine slot or to the drive.
4	Moving	The loader is moving the robot.

Table 4-1 Robot Operation Statuses

The Drive Status line (line 3) can show the following status:

1	Drive Empty	There is no cartridge in the drive
2	Drive Loaded	A Cartridge is Loaded.
3	Drive Idle	A Cartridge is loaded and the drive is ready to use it
4	Drive Rewinding	The Drive is rewinding the tape
5	Drive Seeking	The drive is searching for specific data on the tape
6	Drive Reading	The drive is reading data for transfer to a host via the SCSI interface
7	Drive Writing	The drive is writing data received from a host to the tape
8	Drive Erasing	The drive is erasing data from parts of or the whole of the tape.
9	Drive Cleaning	A Cleaning Tape has been inserted in the Drive and the drive is using it to clean the relevant mechanical parts
10	Drive Loading	A tape has been inserted in the drive. The drive is in the process of mechanically loading it
11	Drive Unloading	The drive is in the process of mechanically unloading the tape
12	Drive Update Ready	The Drive has completed an internal update.
13	Drive Updating	The drive is in the process of an internal FW update
14	Drive Calibrating	A data tape ha been inserted and loaded into the drive. The drive is in the process of measuring its physical properties.

Table 4-2 Drive Operation Statuses

4.2 Front Panel Display Modes

The front panel displays three types of screens for different purposes: the Menus, the Dialogs and the Messages.

4.2.1 Menus

The major contributor is the MENU. It is used to select operations to perform by enabling the operator to navigate a menu tree using the control buttons.

Due to the size of the display, only one menu item is shown at a time. See figure 4.4 for a standard menu layout and figure 4.5 for a complete menu tree.

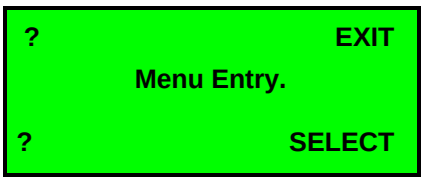


Figure 4.4 Standard Menu Layout

The two filled arrows on the left are used to show the next (down arrow) and previous (up arrow) entries on the current menu level.

The *Exit* button on the right is used to ascend to the menu level above, while the *Select* button is used to descend to the submenu designated by the Menu Text, or to activate the function selected if the Menu Entry describes a function.

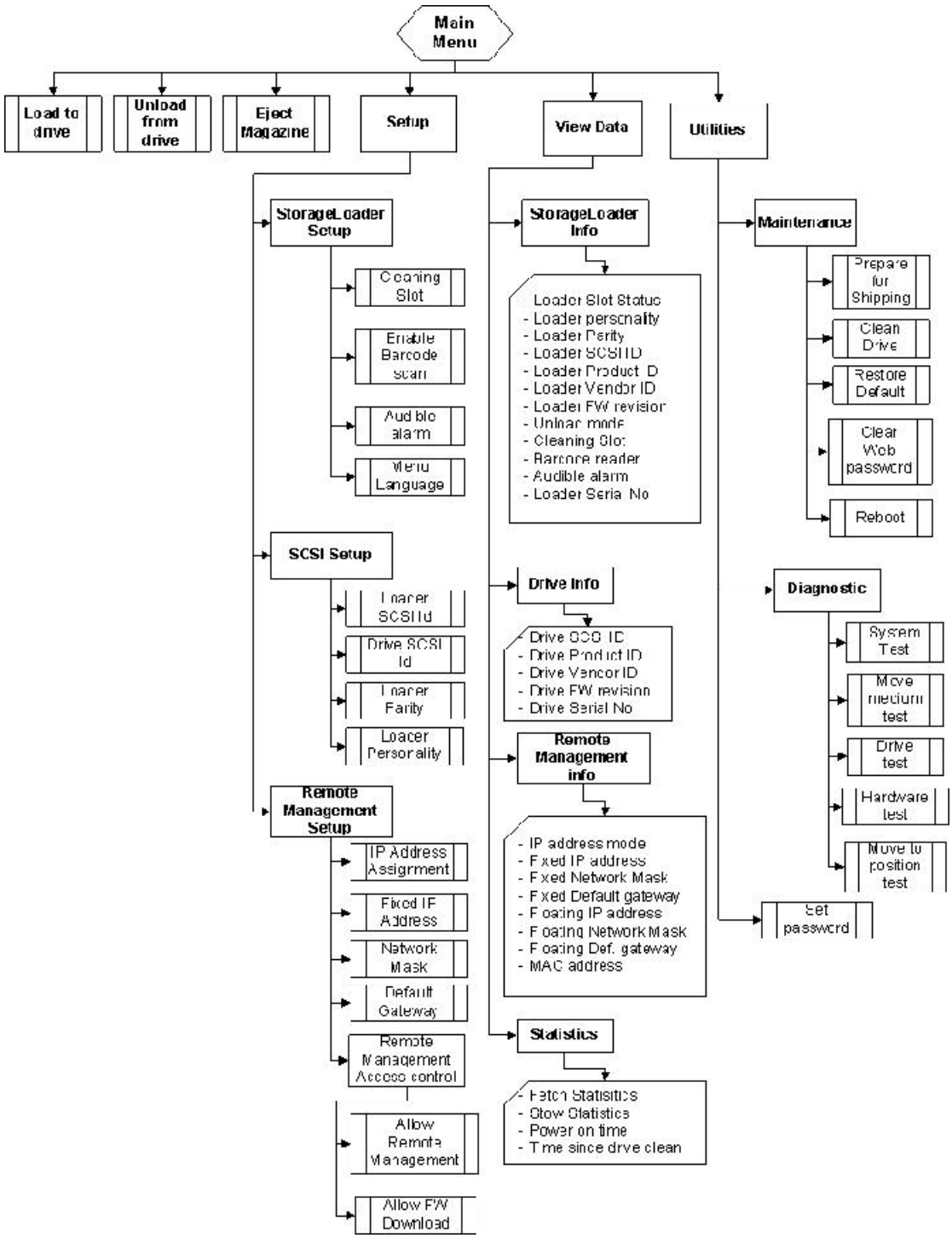


Figure 4.5 The Complete Menu Tree

4.2.2 Dialogs

A dialog is a screen type used to get detailed input from the operator, for example a SCSI ID, a name or a password. See Figure 4.6.

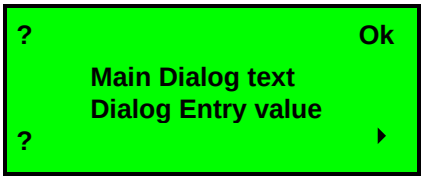


Figure 4.6 Standard Dialog Layout.

The dialogs come in several forms, but there are only a few main types.

Dialogs, Discrete Values

The dialog in Figure 4.7 is used to enter discrete values. It handles one character or digit at a time. The digit or character being manipulated is said to be in *focus.* The digit or character in focus is shown in inverse video. As the character map on the screen used restricts the flexibility of the inverse display of the character, some digits and characters may appear to be mutilated when inverted. For example, the “0” digit appears as an open rectangle when inverted.

The Up and Down arrows on the left are used to increment (up arrow) or decrement (down arrow) the value of the character or digit in focus. If increment is selected and the value of the character of digit in focus is at its highest legal value, it wraps to its lowest legal value and vice versa.

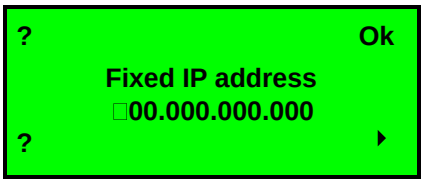


Figure 4.7 Dialog layout, entering discrete values

The Right arrow (on the right) is used to shift the focus one place to the right. If the focus is already at the rightmost position, the focus wraps to the leftmost position.

The *Ok* button is used to accept the value displayed.

If the value was changed, the selected and original values will then be displayed as messages. The operator may then accept or reject the change.The discrete value type of dialog does a running check of the validity of what the user enters, and changes it if needed.

Examples: If the value “0” or “1” is selected in the Fixed IP address dialog above, the user is allowed to select values between “0” and “9” as the next two digits. (The maximum value allowed in this dialog is “255” within each group.) If, however, “2” is selected, only values between “0” and ”5” are available in the second digit. If a value between “0” and “4” is selected for the second digit, “0” to “9” is available for the third, but if “5” is selected for the second digit, only “0” to “5” is available for the third one.
Or
the user selects the value “199” in one group in the above dialog, then presses the “Next Digit” button until the “1” in “199” is selected, and increments it to “2,” so the group shows “299.” Since this is an illegal value, when the user selects the “Next Digit” or the *Ok* to leave the group, the value is changed to “255” and the focus is repositioned to the “2” in the first position of the group.

Dialogs, Predefined Options

The second form of dialog allows the operator to select between a predefined set of options, which can be shown on-screen simultaneously, as when selecting a magazine slot No, see Figure 4.8.

To select a cartridge and move it from a magazine slot to the drive or vice versa, a slightly different dialog is used:

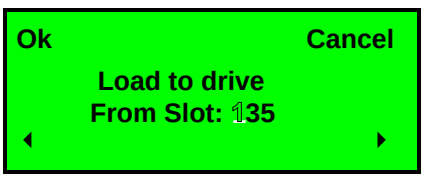


Figure 4.8 Slot dialog layout.

Here, the right and left arrows select the digit to load from. *Ok* accepts the cartridge selected, and *Cancel* aborts the operation.

Figure 4.9 shows the third form, where the operator can select predefined options that can be shown only one at a time.

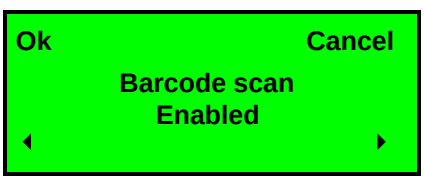


Figure 4.9 Predefined options, showed one at the time.

Here, the user can scroll through a set of options one at a time by using the left and right arrow buttons. Only one option is shown at a time. In the example above, the user can select either "Enabled" or "Disabled" mode.

This kind of menu also has a Cancel function.

4.2.3 Messages

Messages may inform the operator about situations that arise during operation, like error conditions and situations where a process requires operator approval or intervention to continue.

An example of the latter is when the Loader detects a wrong type of magazine. The loader will eject that magazine and show the message "Left (or right) magazine is the wrong type". This message is removed by inserting a correct type magazine.

4.2.4 Status and Information

Some of the menus, dialogs and messages provide status and information in the form of one or two word messages that appear within the display.

An example is the default screen shown in Figure 4.10. It has a navigation button *Menu*, but it displays the cartridge map (Map: __3_5_7_) as the major menu text and the robot's and drive's status (Idle, Empty).

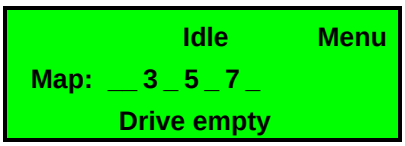


Figure 4.10 A default screen.

Another example is the Message being displayed while a Diagnostics self-test is running. This message shows the progress of the self-test in the form of a loop counter, and also shows the robot status.

4.3 Main Menu

The Main menu contains a set of frequently used functions and links to a set of sub menus.

Item name	Description
Load to Drive	Loads a cartridge from a selected magazine slot into the drive. When **Select** is pressed on this menu item, a magazine slot selection dialog is displayed. The operator has to scroll to the wanted slot and press **Ok** to start the operation. The progress of the operation is displayed, and when the loader part of the operation is completed, the main menu is displayed. The loader must be idle to make this function selectable. See chapter: To load a cartridge to the drive: for more details
Unload from Drive	Unloads a cartridge from the drive and stores it in a selected magazine slot. When **Select** is pressed on this menu item, a magazine slot selection dialog is displayed. The operator has to scroll to the wanted destination slot and press **Ok** to start the operation. The progress of the operation is displayed, and when the operation is completed, the main menu is displayed. The loader must be idle to make this function selectable. See chapter: To unload a cartridge from drive: for more details.
Eject Magazine	Ejects one or both of the two magazines. When **Select** is pressed on this item, a magazine selection menu is displayed. The operator has to choose left, right or both magazines and press **Ok** to start the operation. The progress of the operation is displayed, and when the operation is completed, a status informing the operator that one or both magazines are not in place is displayed. The loader must be idle to make this function selectable. See chapter Magazine Handling for more details.
Setup	Selects the loader and drive setup functions. The loader must be idle to make this function selectable. See chapter Setup Menu for more details.
View Data	Selects the access to loader and drive system data. This is the only menu entry which is selectable when the loader is not idle. See chapter View Data Menu for more details.

Utilities	Selects a set of the loader and drive maintenance and diagnostic functions. The loader must be idle to make this entry selectable. See chapter Utilities Menu for more details.

The Main menu can be selected even if the loader is not in the idle state. While in the main menu, the loader will accept and execute SCSI commands. When any of the main menu entries except the View Data entry is selected, the loader will go to it's busy state and SCSI commands will be terminated with Check Condition and Not Ready status.

4.4 Setup Menu

To enter this menu, scroll to the Setup item in the Main Menu and press the Select button. The loader enters the busy state when this menu is selected.

Item name	**Description**
StorageLoader setup	This menu item gives access to the StorageLoader setup menu.
SCSI setup	This menu item gives access to the SCSI bus setup menu. Both the StorageLoader and the Drive SCSI bus setup are available here.
Remote Management setup	This menu item gives access to the Remote Management setup menu. It allows the operator to enable, disable and configure the Loader Web interface.

4.4.1 StorageLoader setup

The number of selectable values for each StorageLoader setting are listed in the following table.

Item name	**Legal values**.	**Default value**
Cleaning Slot	Legal Slot ID 1..8 or 0 = not selected.	0 = not selected
Barcode scan*	Enabled, Disabled	Enabled
Audible Alarm	Enabled, Disabled	Disabled
Set Language	English	English

* Can be enabled only if a barcode scanner is installed. The barcode of the cartridge in each occupied magazine slot and in the drive (if any) will then be scanned during the Inventory process.

4.4.2 SCSI Setup

The SCSI setup menu allows selection of SCSI addresses for both the Loader and its internal drive. In addition, the SCSI bus Parity can be enabled or disabled. Because of the SCSI protocol, the values selected will only take effect after the next Reset of the Loader and Drive.

Item name	**Legal values**.	**Default value**
Loader SCSI ID	Legal SCSI ID: 00..15	04
Drive SCSI ID	Legal SCSI ID: 00..15	05
Loader Parity	Enabled, Disabled	Disabled
Loader Personality	VS160: AT1280-1R VS160 LTO : AT1280-1R VS160 AT3200-1R LTO2 StorageLoader	VS160 : AT1280-1R VS160

4.4.3 Remote Management setup

The Remote management setup menu allows enabling, configuration and access control to the Loader via the Loader's Remote Management Web interface. The loader may either obtain an IP address, the network mask, and default gateway from a DHCP server, or they can be set manually.

Item name	**Legal values**.	**Default value**
IP Address assignment	Static mode, DHCP mode	DHCP mode
Static IP address *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Network mask *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Default Gateway *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Remote Management access control	This menu gives access to dialogs that enables remote management and remote FW upgrading of the Loader (see table below).	

***** Used only while the IP address assignment is in Static mode.

4.4.3.1. Remote Management Access Control

Item name	Legal values.	Default value
Allow Remote Management	Allowed, Not allowed	Allowed
Allow Remote FW download	Allowed, Not allowed	Not allowed

4.5 View Data Menu

To enter this menu, scroll to the View Data item in the main menu and press the Select button. The loader will remain in its ready state when this menu is selected.

The View Data menu contains the values assigned during device setup (see Setup Menu) but also statistical data related to the drive and the robotics. The view-only fields display data that can be changed from the Setup menu only. If you select the *Change* button and the robot is idle, a dialog appears where the value may be changed. This requires entry of password if the Loader Password system is enabled.

Item name	Description
StorageLoader info	This menu item gives access to the StorageLoader view menu.
SCSI info	This menu item gives access to the SCSI bus view menu. Both the StorageLoader and the Drive SCSI bus parameters are available here.
Remote Management info	This menu gives access to the Selected IP addresses and masks. This menu also shows the MAC address of the unit.
Statistics	This menu item gives access to the Loaders view menus internal count and statistics values.

4.5.1 StorageLoader Info

An overview of the possible values for each StorageLoader setting is listed in the following table.

Item name	Legal values.	Default value

Cleaning Slot	Defined cleaning slot, Disabled	Disabled
Barcode Reader *	Enabled, Disabled	Enabled if installed, else Disabled
Loader Serial No.	Loader Serial number.	---
Loader FW revision	StorageLoader FW id and revision	xx.yy
Loader Vendor ID	Current Inquiry Vendor Id	“TANDBERG”
Loader Product ID	Current HW/FW Product Id	AT1280-1R VS160 or AT3200-1R LTO2
Loader SCSI ID	SCSI Id 0 to SCSI Id 15	SCSI ID = 4
Loader Parity	Disabled, Enabled	Enabled
Loader Slots State	View status for each loader slot	Not applicable
Loader personality	VS160: AT1280-1R VS160 LTO : AT1280-1R VS160 AT3200-1R LTO2 StorageLoader	VS160 : AT1280-1R VS160
Audible Alarm	Enabled, Disabled	Disabled

* Can only be enabled if a barcode scanner is installed.

4.5.2 Drive Info

The different drive types used in the StorageLoader may not provide all the information listed below. If an unavailable entry is selected, the string “Data Unavailable is displayed.

Item name	**Legal values**	**Default value**
Drive Product ID	Drive Inquiry Product Id	Drive dependent
Drive Vendor ID	Drive Inquiry Vendor Id	Drive dependent
Drive FW Revision	Drive Firmware Revision	Drive dependent
Drive Serial No.	Drive Serial Number	Drive dependent
Drive SCSI Id	SCSI Id 0 to SCSI Id 15	SCSI ID = 5

4.5.3 Remote Management Info

The Remote Management (RMM) setup is shown in the choices listed below. This menu three is the place to find the currently allocated dynamic IP address, default gateway and network mask when running in DHCP mode. The MAC address of the Loader is also shown here.

Item name	Legal values	Default value
IP address mode	Static mode, DHCP mode	DHCP mode
Static IP address	0.0.0.0 to 255.255.255.255	0.0.0.0
Static netmask	0.0.0.0 to 255.255.255.255	0.0.0.0
Static default gateway	0.0.0.0 to 255.255.255.255	0.0.0.0
Dynamic IP address	0.0.0.0 to 255.255.255.255	Not applicable
Dynamic netmask	0.0.0.0 to 255.255.255.255	Not applicable
Dynamic default gateway	0.0.0.0 to 255.255.255.255	Not applicable
MAC-address	Value is fixed	Value is fixed

4.5.4 Statistics

Item name	Description
Fetch Statistics	When selected, the operator can scroll through the fetch count and fetch retries for the drive and all magazine slots.
Stow Statistics	When selected, the operator can scroll through the stow count and stow retries for the drive and all magazine slots.
Power On Time	Displays Power On Hours for the loader
Time since clean	If available from the drive, this entry displays number of hours since the drive was last cleaned.

4.6 Utilities Menu

Option	Description
Maintenance	Displays a set of maintenance functions

Diagnostics	Displays a list of exercise test programs
Access control	Set Password

4.6.1 The Maintenance Menus

Item name	Description
Prepare to Ship	When selected the robotics will be positioned for installation of the locking screw. It will eject the Right magazine to facilitate the installation. It will also eject the left magazine if it contains one or more cartridges. The Loader cannot be safely shipped with cartridges in the magazines This option must be executed before the loader is prepared for transport by inserting the Locking Pin. (See chapters 3.1, Performing the Installation and 6.4, Reinstalling the Transport Lock.)
Clean Drive	Performs a drive clean provided a slot is reserved for a cleaning tape and a cleaning tape is present
Restore default	Sets the loader settings to their factory default values.
Clear Web Password	Deletes the web passwords. This is useful when the password is lost.
Reboot	Performs a hard reset of the loader.

4.6.2 The Diagnostics Menu

Item name	Description
System test	Starts a test where cartridges are moved randomly between magazine slots and between the drive and the magazines.
Move medium test	Starts a test where cartridges are moved randomly between magazine slots. The drive is excluded.
Drive test	Starts a drive self test. (Only when supported by the installed tape drive.)
Hardware test	Runs a test of the loader hardware, including the Loader internal cabling.

4.6.3 Set Password

Item name	Description
Set Password	Allows the operator to set a four-digit password protection for the menu system. The default password is <0000>, meaning the password is disabled.

WARNING: If you set a password, make sure you do not forget it. If you do, it can only be cleared with assistance from Tandberg Data technical support or by a qualified service technician.

4.7 Cartridge Handling

4.7.1 Cartridge Slot Numbers

The cartridge slots have been given numbers as follow: (see also Figure 2.3 Internal components of the StorageLoader)

Left magazine: Slot 1, Slot 2, Slot 3 and Slot 4 (lowest number closest to the front)

Right magazine: Slot 5, Slot 6, Slot 7 and Slot 8 (lowest number closest to the front)

4.7.2 Moving Cartridges to and from the Drive

The normal operations of the unit are controlled by the host software application. When you must load or unload a specific cartridge using the control buttons on the front panel, do the following:

To load a cartridge to the drive:

1. From the default display press the menu button and select *Load to Drive* from the main menu. A screen picture like figure 4.11 will be displayed. If a Barcode reader is implemented, the selected cartridge's barcode is displayed in the bottom line.

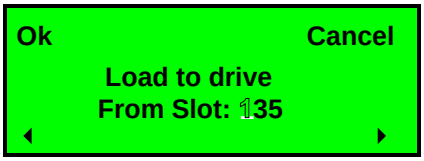


Figure 4.11 Load to Drive

2. Select the slot number of your choice. The system ignores empty slots. Press the ▸ button to increment and the ◂ button to decrement.

3. Press the Ok button.

   The robot removes the cartridge from the selected magazine slot and moves it to the drive.

To unload a cartridge from drive:

1. From the default display, press the menu button and select *Unload from Drive* from the main menu. A screen picture like figure 4.12 will be displaying the available slots.

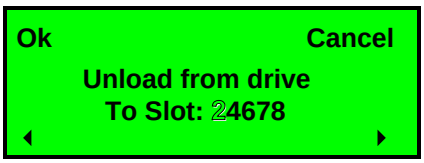


Figure 4.12 Load to Drive

2. Select the cartridge slot number of your choice. Press the ▸ button to increment and the ◂ button to decrement.

3. Press the Ok button.

   The robot removes the cartridge from the drive and moves it to the selected magazine slot.

If the drive is empty, a screen picture like the next figure is displayed.

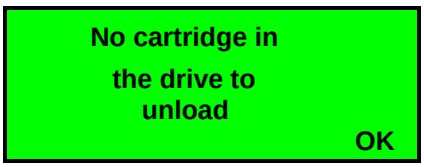


Figure 4.13 Empty Drive Message

4.8 Magazine Handling

You must remove the magazine from the unit in order to insert or remove cartridges. When inserting cartridges, be sure that the slot you intend to use is not already reserved by the software application for a cartridge in the drive. The best way to avoid conflicts is to unload the cartridge from the drive; either through your software application or by using the *Unload from drive* option in the main menu.

4.8.1 Removing the Magazine from the Unit

The following illustration shows the correct way to remove the magazine from its bay.

Note: *You cannot remove the magazine if the unit is password protected or locked by host software through a* ***Prevent Medium Removal*** *SCSI command.*

Before you can remove a magazine, the loader must be idle. When the loader is idle, press the Menu button and select the Eject Magazine option from the Main Menu.

The following screen, figure 4.14, appears, identifying the magazine:

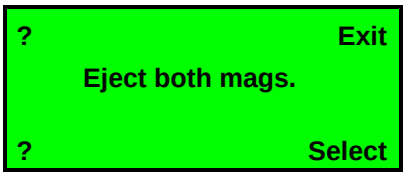


Figure 4.14 Removing magazine

Scroll to the correct magazine (Both, Left or Right magazine) and press *Select*. The selected magazine will pop out 2 to 3 cm, See next figure.

The display will show a message telling that the magazine or magazines is/are ejected. *If only one magazine is ejected, the display indicates a button to push to eject the other magazine.*

Figure 4.15 Magazine eject

With one hand, grip the handle on the outer side of the magazine bezel and hold the other hand under the magazine. Pull the magazine carefully out and keep it in level with the loader. Use the

hand under the magazine to prevent the back of the magazine to fall down when it leaves the magazine bay. See illustration below.

Figure 4.16 Removing the magazine from the loader

4.8.2 Inserting Cartridges into the Magazine

When inserting cartridges the access door of the cartridge must face the magazine. Push it carefully into the magazine until it locks in place. The rear side of the cartridge with the Write Protect switch and the barcode label must face out. Make sure the cartridges latches properly.

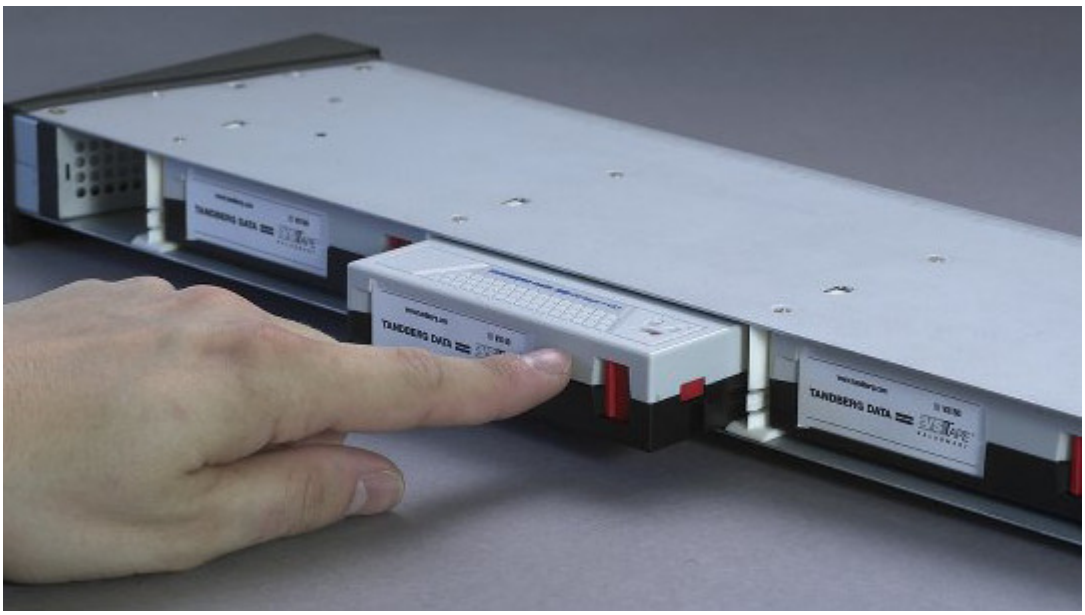


Figure 4.17 Gently push the cartridge into the magazine slot

4.8.3 Removing Cartridges from the Magazine

Press the cartridge release tab towards the cartridge until the

cartridge is released. The cartridge is spring loaded so it is important to prevent the cartridge from popping all the way out. ***If the cartridge falls down, it may be damaged and data may be lost***. Pull the cartridge carefully out of the magazine slot.

Figure 4.18 Push the release knob towards the cartridge to eject

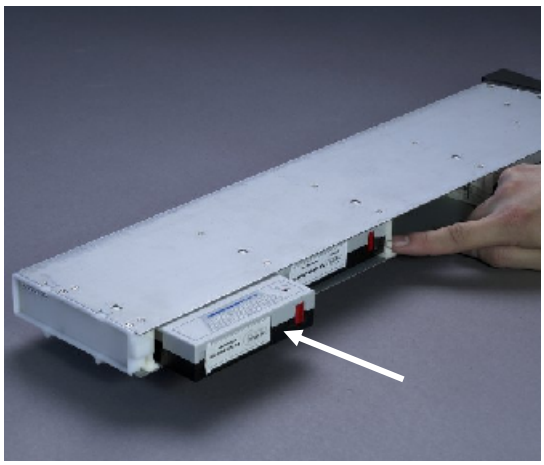


Figure 4.19 Cartridge position after manual release from magazine slot

4.8.4 Inserting a Magazine into the Unit

The right and left magazines are mirrored and can only be inserted into the correct left or right magazine bay. See figure 4.20.

1. Enter the back of the magazine into the correct magazine bay. Make sure it is in level with the loader.
2. Slide the magazine carefully in until the eject spring engages.
3. Push the magazine further in against the spring until the magazine is latched.

Figure 4.20 Push magazine until it clicks into place

4.8.5 Manual/Emergency Release of Magazines

In case of failure situations either in the loader itself, a power loss, or if you want to manually release the magazines for some other reason, a manual/emergency release is available. To activate the emergency magazine feature, you must use the special magazine release tool which is part of the accessory kit shipped together with the StorageLoader. This tool must be entered through the hole marked in figure 4.21.

Note: *The manual eject must only be used when power is turned off.*

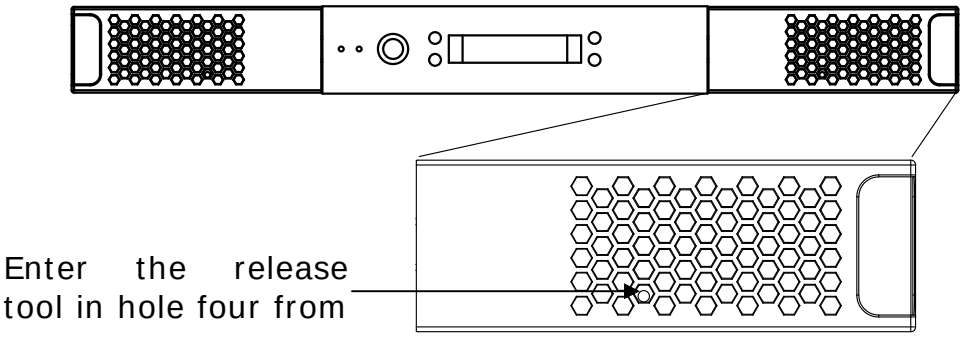


Figure 4.21 Pointing out hole used to insert release tool

Figure 4.22 shows the release tool inserted into the correct hole on the right hand side magazine bezel.

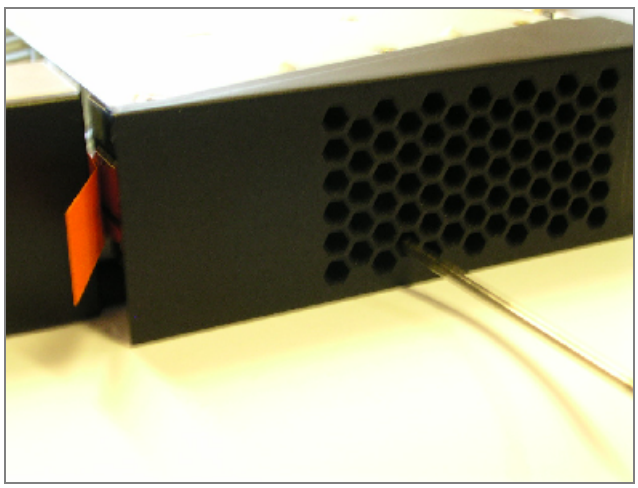


Figure 4.22 Magazine release tool in use

4.9 Standby Functionality

On the front panel a standby button is available.

To activate Standby mode, press the button for a minimum of 2 second, the StorageLoader will then enter a standby mode in a controlled manner. The following takes place before the StorageLoader goes into standby mode.

1. Finish possible StorageLoader activity.
2. Controlled aborting of tape drive activity; buffered data is flushed to tape; cartridge is unloaded from drive but not ejected.
3. The display is turned off.
4. No StorageLoader activity is allowed until standby button is pressed again.
5. While in standby mode, the attached server/host can see the two SCSI devices in the StorageLoader, but the SCSI status will be “not ready.”
6. The green LED on the front will blink with short blinks- long intervals.
7. To leave the standby mode, press the standby button for 2 seconds. The StorageLoader will then restart and perform a full inventory.

5. Remote Management

In order to facilitate Remote Management, the StorageLoader is equipped with an Ethernet interface and a built in web server. The Remote Management Interface (RMI) can be accessed with a standard web browser, such as Internet Explorer, Mozilla or Opera.

5.1 Remote management configuration

To be able to start the StorageLoader Remote Management Interface, the StorageLoader must obtain a valid IP address. By default, the StorageLoader will connect to a DHCP server to dynamically configure its network interface. If a DHCP server is available, the loader will get an IP address automatically after booting.

If no DHCP server is available, select *Static mode* and enter a legal IP-address, netmask and default gateway with the buttons. In the browser's address field, enter the IP address of your StorageLoader. See section 4.4.3, Remote Management setup for details.

5.1.1 Quick start guide

The following is intended to help you get a new StorageLoader online as quickly as possible. If you need to enable the RMI to perform a memory dump of a faulty StorageLoader, please see section 5.1.2, Enabling the RMI without rebooting instead.

1. Connect the StorageLoader to the network and reboot it.
2. From the front panel, check the dynamic IP address by accessing View data → Remote management info → Dyn IP addr. state.
   - 2.1. If the response is a valid IP address, the remote management interface is ready and can be accessed at the URL http://IP-address/, e.g. http://192.168.0.5/.
   - 2.2. If the response is 0.0.0.0, enable remote management from the front panel by setting Setup → Remote management setup → Allow remote management to Allowed. Check the network cable and the DHCP server and reboot.

5.1.2 Enabling the RMI without rebooting

1. Connect the StorageLoader to the network.
2. Configure network:

2.1. If you want to use a static IP address, use the front panel to enter a valid static IP configuration, see section 4.4.3, Remote Management setup.

2.2. If you want to configure the network subsystem dynamically, from the front panel set Setup → Remote management setup → IP address mode to DHCP mode.

3. Via the front panel, first set Setup → Remote management setup → Access control → Allow remote management to Not allowed and select OK. Then set the same value to Allowed and select OK. This will restart the networking subsystem. Getting a new IP address may take some time if the StorageLoader is in DHCP mode.

4. Check the IP address via the front panel by accessing either View Data → Remote management info → Sta IP addr. state or View Data → Remote management info → Dyn IP addr. state depending on whether the StorageLoader is in static or dynamic IP address mode.

5.2 Remote management web pages

Most of the operations you can perform from the front panel can also be performed remotely using Web Administration. The Remote Management interface provides access to loader and drive status and statistical operation information.

The Web pages include a navigation menu making it easy to use, see figure 5.1.

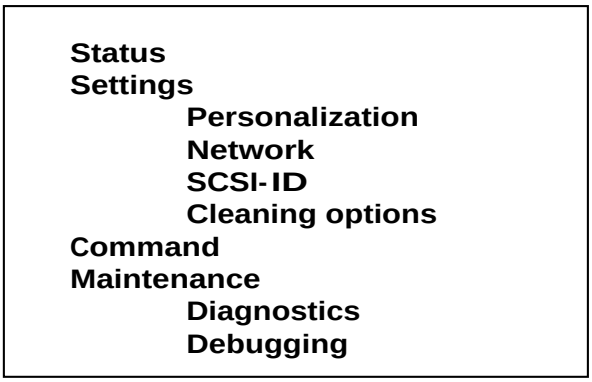


Figure 5.1 Navigation Menu

5.2.1 Information Boxes

All the Remote Management web pages show StorageLoader and drive information. This information includes:

- StorageLoader information containing model, serial number, firmware version, cumulative power-on time and present activity of the loader.

- Drive information containing technology, serial number, firmware version and activity.

5.2.2 StorageLoader Start Page

After successfully connecting to the StorageLoader from your browser, you will see the StorageLoader Start page, figure 5.2. This contains:

- Select language for user-interface.

  1. The language used last time will come up as the default language at start-up.

  2. The default language is English.

- Log in for further use of Remote Management. The system has two levels of login. By default the passwords are blank, i.e. type in the user ID and leave the password field blank. To secure your system, change both passwords under Settings > Personalization, the first time Remote Management is used.

  1. The user ID Administrator has full access to the Remote Management pages.

  2. The user ID Operator has limited access to the Remote Management, and cannot access the Settings and Maintenance pages.

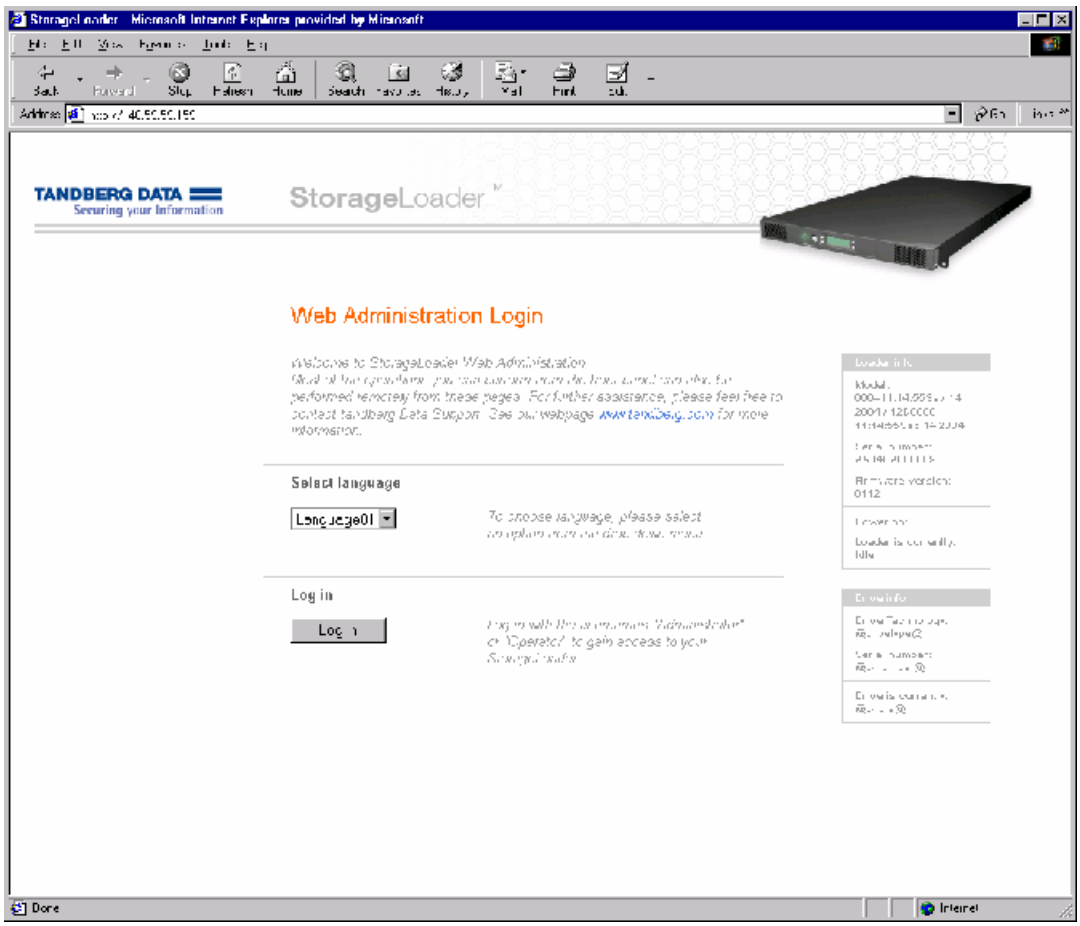


Figure 5.2 Remote Management Start Page

***Note**: StorageLoader network traffic is not encrypted, so anyone with physical access to the network path will be able to access the information with a packet sniffer. Passwords, however, are encrypted. It is not possible to reach the plaintext password, but it is possible to sniff "the challenge key" and use it to gain access. The system is therefore not safer than the network it is using.*

If you need high security, make sure packets to and from the StorageLoader do not leave the secure network, and employ separate encryption when traffic traverses insecure networks.

5.2.3 Status Page

The StorageLoader Status page looks like the figure below.

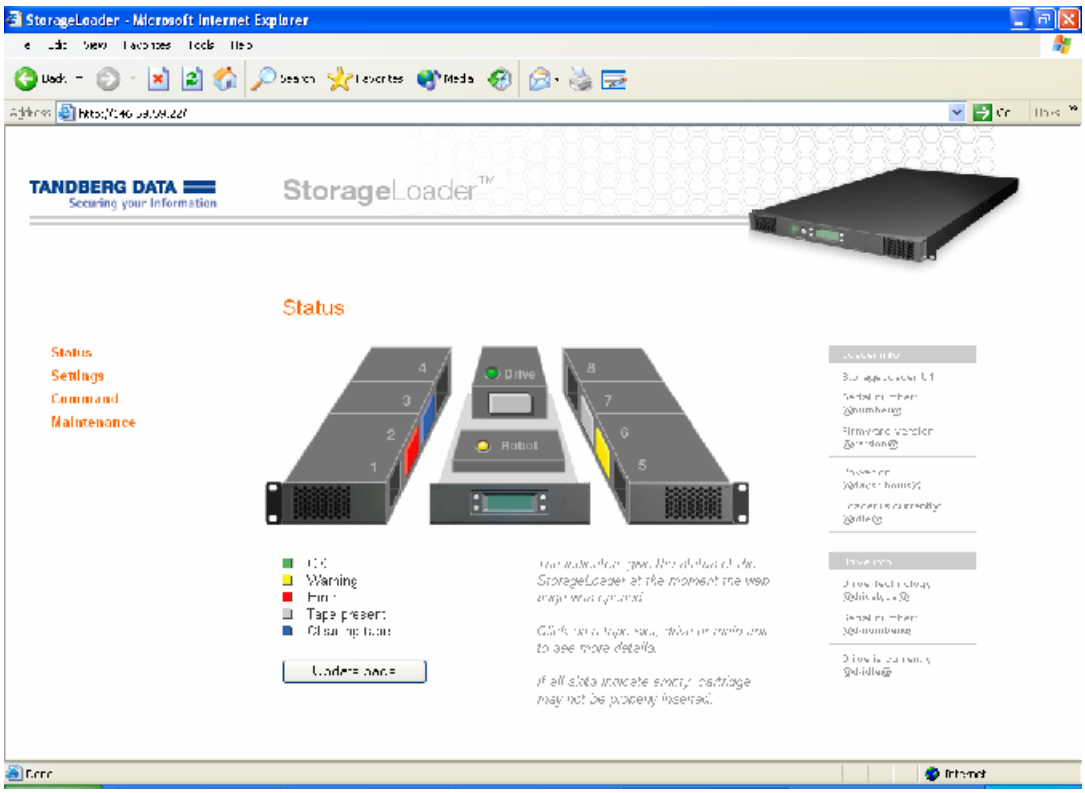


Figure 5.3 Remote Management Status Page

The figure provides an updated status of drives, robotics and cartridges using color-coding and symbols.

The Drive and Robot status will be shown as a green (OK), yellow (Warning) or red (Error) dot. If you click on the text, additional information will be shown in a pop up window.

The cartridge locations are shown with rectangles in the slots or the drive. The status codes are:

- Black Empty slot, no cartridge present
- Grey Cartridge present
- Blue Cleaning cartridge in the slot
- Yellow Warning
- Red Error

If you click on a slot, additional cartridge information will be shown in a pop up window. This information includes the cartridge barcode (if label and barcode reader is installed) and the error code.

5.2.4 Settings Pages

On the setting pages, you can change the StorageLoader configuration. These pages can only be accessed by someone who is logged in as Administrator.

Personalization

On this page you can change the Remote Management passwords. To secure your system, change both the passwords the first time you use the system. It is possible to clear the remote management passwords via the front panel, please see section 0 The Maintenance Menus.

Here you may also turn on email event notification. When event notification is enabled, the StorageLoader will send warnings and errors by email to the recipient's e-mail address.

Network

On this page it is possible to change the IP configuration. See details in chapter Remote Management setup. The new configuration will take effect at next system reset.

Warning: Please verify that the chosen settings are correct and consistent before resetting the loader. Any mistakes will have to be corrected via the front panel.

SCSI-ID

On this page it is possible to change the SCSI-ID on your drive and loader. See details in section 4.4.2, SCSI Setup.

Cleaning Options

By defining a cleaning slot, the StorageLoader will regard the cartidge in this slot as the cleaning cartridge unless:

1. another cartridge has previously been reported to be a cleaning cartridge by the drive, or
2. the loader contains a cartridge with a bar code label indicating that it is a cleaning cartridge.

5.2.5 Command Page

On this page it is possible to move cartridges between magazine slots and drive. All cartridges in the StorageLoader will be found in a pull-down list sorted by location. The other pull-down list shows the empty locations where it is possible to move the cartridge to.

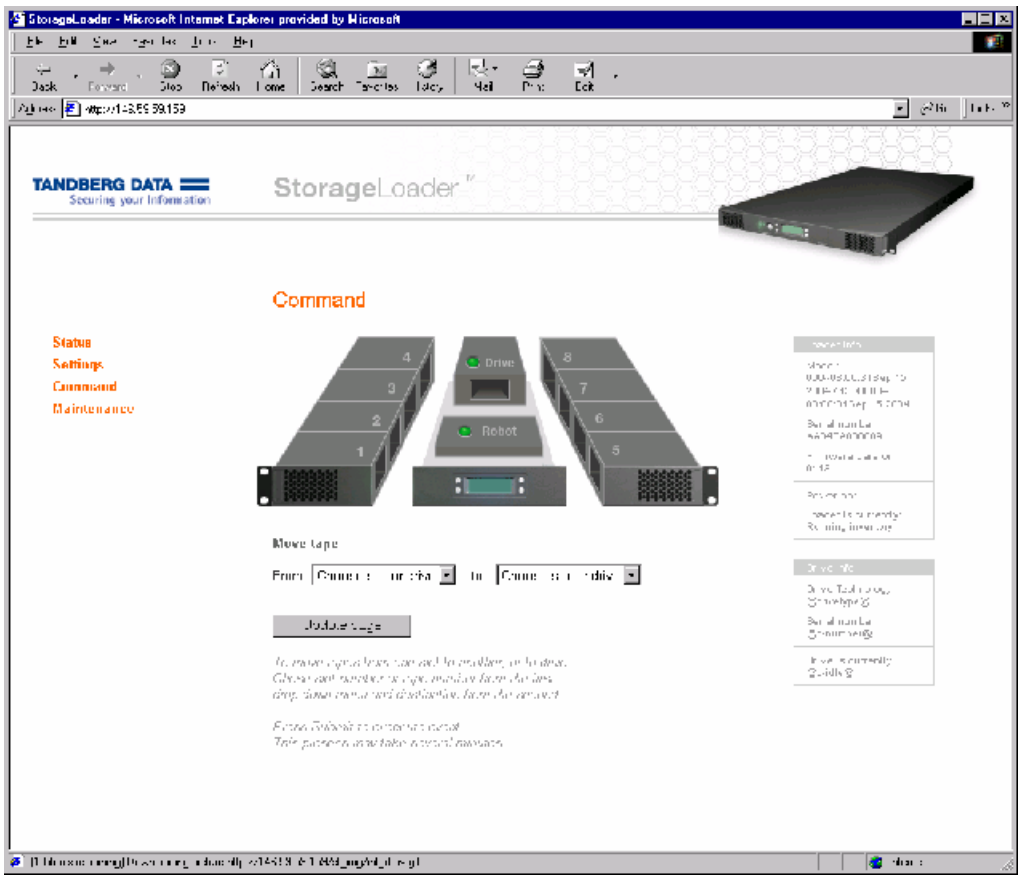


Figure 5.4 Remote Management Command Page

5.2.6 Maintenance Pages

On these pages it is possible to select predefined tests and actions in order to check the reliability of the StorageLoader.

Diagnostics

- Clean the drive by importing a cleaning cartridge.
- If you choose *Identify loader*, the front panel display light will toggle on and off for 15 seconds. This makes it easy to verify that you are connected to the correct loader if several loaders are stacked.
- Test robotics by moving cartridges.
- Test robotics without moving cartridges.

Debugging

- Memory dump will download a snapshot of the system memory of the loader to a file that can be sent to Tandberg Data's service for diagnostic purposes.
- Perform a system reset.
- Media log displays a log of all cartridge movements and a map of the current cartridge locations.

6. Maintenance

6.1 Using the Cleaning Cartridge

The cleaning cartridge is similar in size and shape to the regular DLT/LTO data cartridge. If your Storage Loader has a barcode reader, put a cleaning cartridge barcode label on the cartridge before using it.

Important: *This label has a six-digit ID, where the three first digits are "CLN".*

A cleaning occurs whenever a cleaning cartridge is loaded into the drive. Before cleaning, you must install the cartridge into the magazine correctly. The cleaning cartridge may be inserted in any magazine slot.

NOTE: The only absolute authority on Cleaning Tapes is the drive. The drive will start a cleaning operation whenever a tape recognized as a cleaning tape is inserted. The Loader has no way to recognizing a cleaning tape by itself. It may be misleaded by a wrong label on a data tape, by a data tape inserted in a designated Cleaning Slot, or by the operator.

6.1.1 Running an Installed Cleaning Cartridge

1. Install a cleaning cartridge in a magazine slot in the loader. If a Cleaning Slot is defined this slot should be used.
2. Select Clean Drive from the Maintenance section of the Utilities menu. This will cause the loader to search for a cleaning cartridge in the following sequence:
   a. a cartridge reported to be a cleaning cartridge by the drive
   b. a cartridge with a bar code label indicating that it is a cleaning cartridge

c. a cartridge in the slot defined as the cleaning slot.

If all of the above fails, the loader will display a dialog asking the operator for the slot to fetch the cleaning cartridge from.

3. While the cleaning operation is on-going, the display shows the drive status “Drive Cleaning”. When the operation is completed the cartridge is automatically moved back to the slot where it was fetched from.

If a data tape is erronously inserted via the loader “Clean Now” menu, this is detected by the loader when the drive identifies it as a non-cleaning tape. The cartridge is returned to it’s original slot and an error message is displayed.

Some drive families and types have means of checking if the cleaning cartridge is expired. If an expired cleaning cartridge is inserted in such a drive this is detected by the loader and an error message is displayed after the tape has been returned to it’s original slot.

Note: All cleaning cartridges wear out. If the drive does not support expiration detection, the operator must keep track of cleaning cycles manually and discard expired cartridges.

Note: Pressing the standby button while the drive is cleaning will not abort the cleaning operation in the drive. However the cleaning cartridge is left loaded in the drive. When the loader is brought out of standby mode, the drive is reset as part of the initialization process. The drive will re-discover the cleaning cartridge and run another cleaning sequence. The cleaning cartridge is left in the drive and must be unloaded by the operator by using the unload command from the front panel menu.

6.1.2 Removing the Cleaning Cartridge

1. Determine whether a cartridge is loaded into the drive. If so, unload it.
2. Remove the magazine with the cleaning cartridge from the unit.
3. Remove the cleaning cartridge from the magazine.
4. Insert any desired data cartridge into the slot vacated by the cleaning cartridge.

   Note: *The Cleaning Slot must be disabled (set to 0) in the Setup menu to make use of a data cartridge in this slot.*
5. Insert the magazine into the unit.

6.2 Installing Firmware Upgrades

The loader FW can be upgraded via the SCSI interface.

6.2.1 Firmware Upgrade via SCSI

A suitable utility program, FlashIt, and the latest FW image file, can be downloaded from the Tandberg Data web site http://www.tandberg.com/. The program is available for Win XP, Win 2000/2003, Win Nt.

Note: *Read this entire procedure before you perform an upgrade.*

1. Install the FlashIt utility that is designed for your operating system on your computer or server were the loader is connected.
2. Make sure the computer has detected the loader.
3. Some operating systems, like Win NT, may require that all backup services started by the Backup SW be stopped before the FlashIt utility is started.
4. The appropriate FW file must be located on the same directory as the FlashIt utility.
5. Start the FlashIt utility and follow the instructions in the program.
6. As the Download Utility begins data transfer, the StorageLoader displays this message:

   Flash Firmware SCSI Update: Transferring Data

7. When the FW image file has been downloaded, the loader checks the integrity of the FW image while displaying this message:

   Flash Firmware SCSI Update: Checking ECC

8. Once the code is approved the loader starts the erase and reprogram operation while displaying this message:

   Flash Firmware SCSI Update? Reprogramming Do not interfere!

   During the Erase part of the reprogramming cycle, the Amber LED is lit to warn against interference. The erase operation takes less than 20 seconds.

   During the Programming part of the reprogramming cycle, the Green LED

flashes in addition to the Amber LED being lit. The programming operation takes less than one minute.

9. When reprogramming is completed, the loader will do a normal reboot

If the firmware upgrade operation failes during point 8 due to a power shut-down or similar, the loader may require service.

To verify that the FW version in the loader is correct, enter the view data menu. Select the “Autoloader Info” and from there the “Loader Firmware Revision” entry to see the revision number.

6.2.2 Possible Upgrade Problems

If a power loss or a failure occurs during code download and ECC Checking, the original FW may be intact. It is possible to restart the FW upgrade procedure. However, if the failure occurs during flash erase or programming, the firmware will be corrupted and a special procedure must be used to load a new code. Contact your Technical Support Representative for assistance.

6.3 Embedded Diagnostics

The StorageLoader includes two levels of diagnostics:

- *The Power-On Self Test (POST)* — Performs several verification and memory tests when you power on the unit.
- *User Diagnostics* — Selectable from the front panel

6.4 Reinstalling the Transport Lock

Before the StorageLoader is shipped over a distance, the transport lock must be installed. The transport lock will prevent damage to the robotics during transport and handling.

Note: *Damage to the robotics during shipping will not be covered by warranty unless the transport lock is*

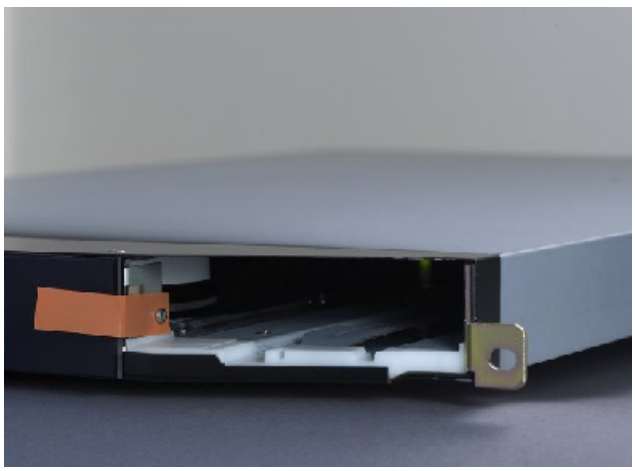


Figure 6.1 Transport lock marked with red plastic tab

installed. The transport lock must be removed prior to operation.

6.4.1 Transport Lock Installation Procedure

To insert the locking screw do the following:

1. If there is a cartridge in the drive, unload the drive first.

When the loader is powered on and idle, push the ***Menu*** button and go to the *Prepare to Ship* menu entry (see section 0,
2. The Maintenance Menus).

3. If there are any cartridges in the magazines, the loader will eject those magazines and a descriptive message will be shown. Empty the magazines, and put the magazines back in place.

4. If the magazines are empty, only the right magazine will be ejected and a descriptive message will be shown.

5. Turn the main power off at the back of the loader.

6. Remove the magazine and insert the locking screw. The red plastic tab shall protrude from the front of the loader.

7. Insert the magazine and push it in till it locks in place.

6.5 Field Replaceable Units (FRUs)

Tape drives, magazines, power supply, fans and dust filters are Field Replaceable Units (FRUs), see figure below. They can easily be removed/replaced for quick field service while the loader is mounted in a rack.

Figure 6.2 Field Replaceable Units

6.5.1 FRU Drive Tray Assy DLT VS160 SCSI

This VS160 drive FRU consists of the following parts:

006978 StorageLoader FRU Drive Tray Assy DLT VS160			
Item	**Part no**	**Description**	**Qty**
1	006957	DLT VS160 Bare Drive	1
2	433308	Quick Installation guide FRU Drive Tray Assy DLT VS160	1

For replacing the tape-drive, switch off the loader, disconnect the power cord and remove these two screws and the back-panel cover plate.

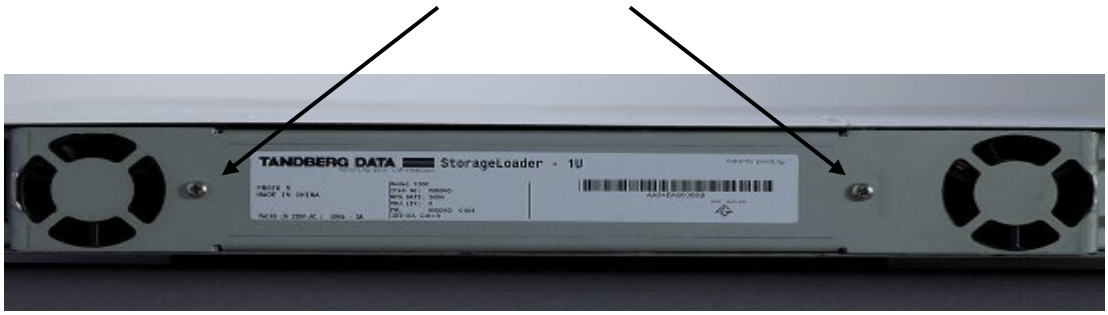


Figure 6.3 Replacing the tape drive

You now have access to the rear of the tape-drive and can dismount the SCSI cable, the ADI cable and the power cable.

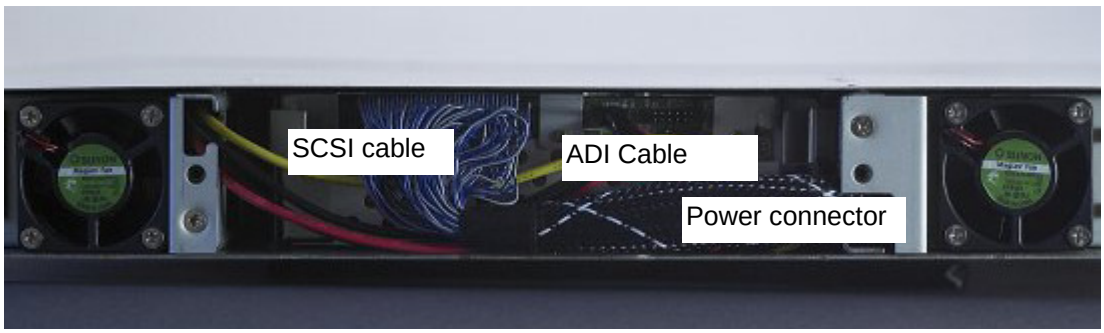


Figure 6.4 Rear of the tape drive

Release the tape-drive by pushing the spring against the gripper-plate and pulling the drive carefully backwards.

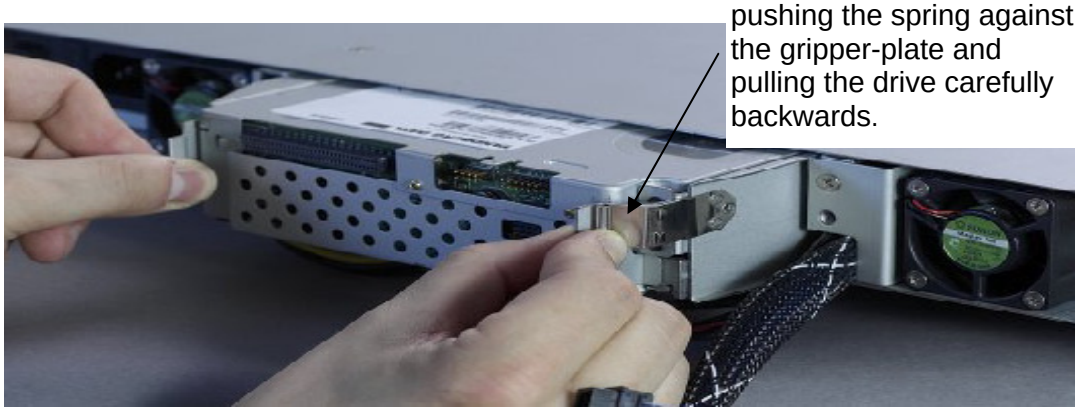


Figure 6.5 Releasing the tape drive

After removing the defective drive, the drive mounting brackets on both sides of the drive must be removed from the drive, since these will be used for mounting the replacement-drive. The drive mounting brackets are fastened with two screws each.

The replacement drive comes with a front bezel which is snapped onto the front of the drive. Remove the front bezel and keep it for use when returning the defective drive. Fasten the drive mounting brackets to the replacement-drive with two screws each.

The drive mounting bracket on the drive's left side has a Guide cartridge mounting (figure 6.6) for guiding the cartridge in and out of the drive.

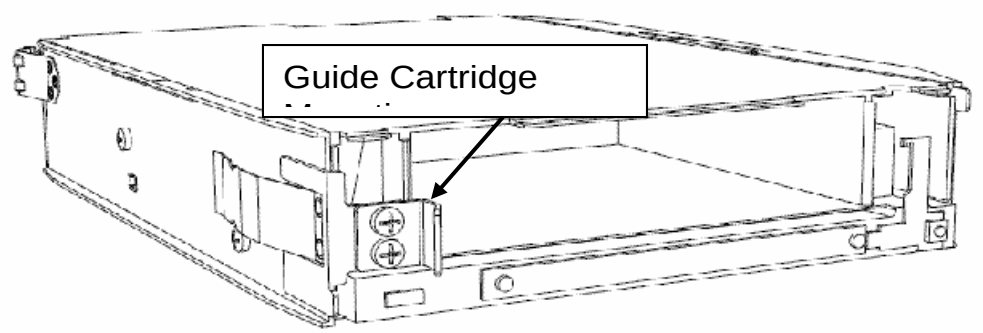


Figure 6.6 Guide cartridge mounting

Make sure that the Guide cartridge mounting is mounted in flush with the inner left wall of the drive, as indicated in figure 6.7. The two screws shown in figure 6.6 can be loosened for adjusting the position of the Guide cartridge mounting. Remember to fasten the screws again afterwards.

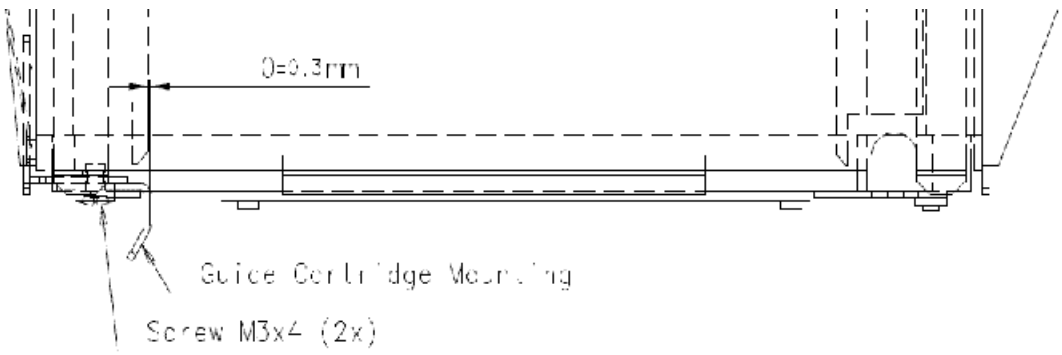


Figure 6.7 Correct position of Guide cartridge mounting

Insert the replacement drive carefully into the loader the same way it was removed, reconnect the 3 cables (the ADI cable is mounted closest towards the SCSI cable) and re-mount the back plate.

Snap the front bezel that was removed from the replacement-drive onto the front of the defective drive. Then pack the defective drive in the same box you received the replacement-drive and return it to your support center.

6.5.2 FRU Drive Tray Assy 220LTO and 420LTO

The 220LTO drive FRU consists of the following parts:

007171 StorageLoader FRU Drive Tray Assy 220LTO		
Item	**Description**	**Qty**
1	220LTO Bare Drive SCSI	1
2	Quick Installation guide FRU Drive Tray Assy 220LTO	1

The 420LTO drive FRU consists of the following parts:

006979 StorageLoader FRU Drive Tray Assy 420LTO		
Item	**Description**	**Qty**
1	420LTO Bare Drive SCSI	1
2	Quick Installation guide FRU Drive Tray Assy 420LTO	1

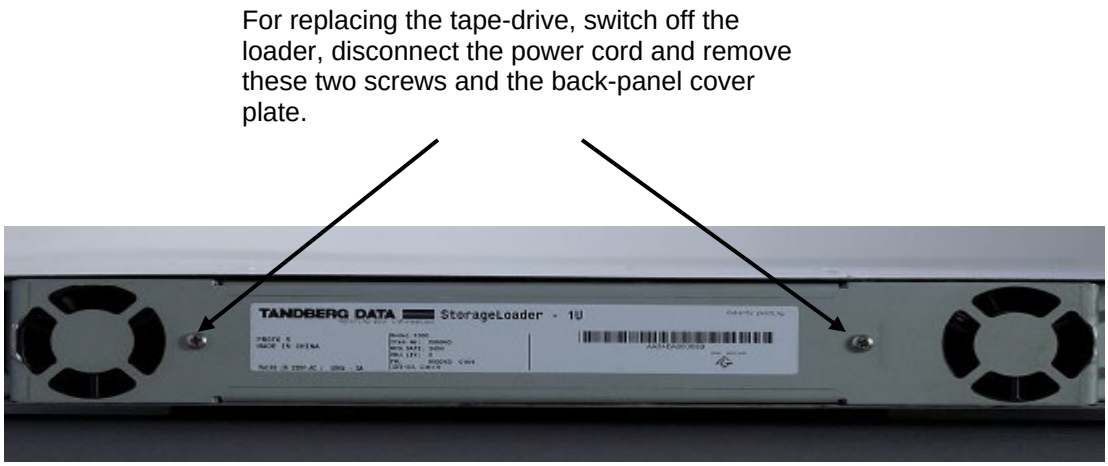

For replacing the tape-drive, switch off the loader, disconnect the power cord and remove these two screws and the back-panel cover plate.
TANDBERG DATA
StorageLoader - 1U

Figure 6.8 Replacing the tape drive

You now have access to the rear of the tape-drive and can dismount the SCSI cable, the ADI cable and the power cable.

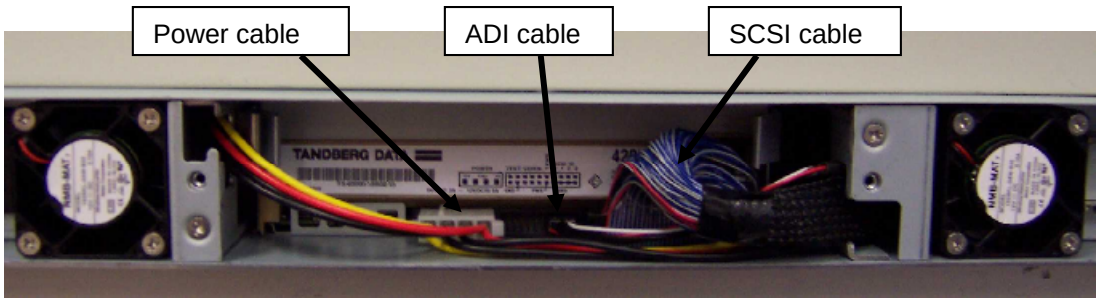


Figure 6.9 Rear of the tape drive

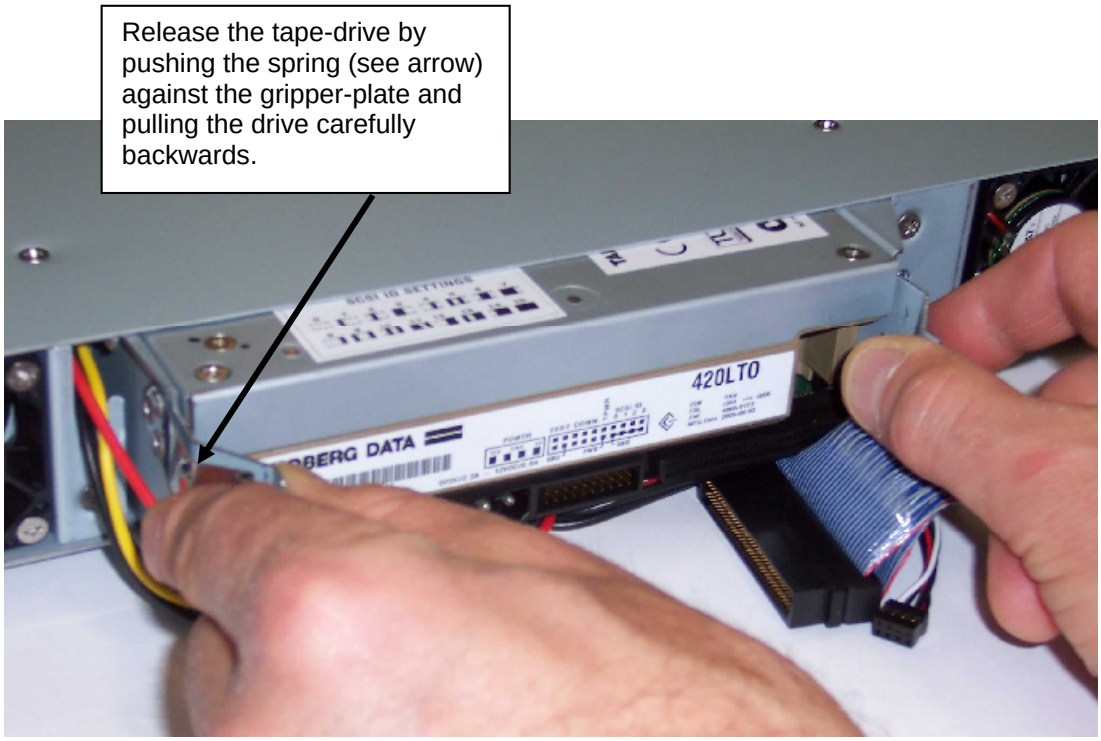

Release the tape-drive by pushing the spring (see arrow) against the gripper-plate and pulling the drive carefully backwards.
420LTO

Figure 6.10 Releasing the tape drive

After removing the defective drive, the drive mounting brackets on both sides of the drive must be removed from the drive, since these will be used for mounting the replacement-drive. The drive mounting brackets are fastened with two screws each.

The replacement drive comes with a front bezel which is snapped onto the front of the drive. Remove the front bezel and keep it for use when returning the defective drive. When fastening the drive mounting brackets to the replacement drive, have the

drive and the brackets laying on a level surface to ensure the brackets are aligned with the bottom of the drive. Fasten the brackets with two screws each.

Insert the replacement drive carefully into the loader the same way it was removed, reconnect the 3 cables (the ADI cable is mounted closest towards the SCSI cable) and re-mount the back plate.

Snap the front bezel that was removed from the replacement-drive onto the front of the defective drive. Then pack the defective drive in the same box you received the replacement-drive and return it to your support center.

6.5.3 FRU Power Supply

This FRU consists of the following parts:

S808696 Power Supply FRU StorageLoader 1U		
Item	**Description**	Qty
1	Power supply	1
2	Quick Installation Guide Fan	1

To exchange a defective power-supply switch off the loader and disconnect the power cord. Dismounting the backpanel cover plate by removing these two screws:

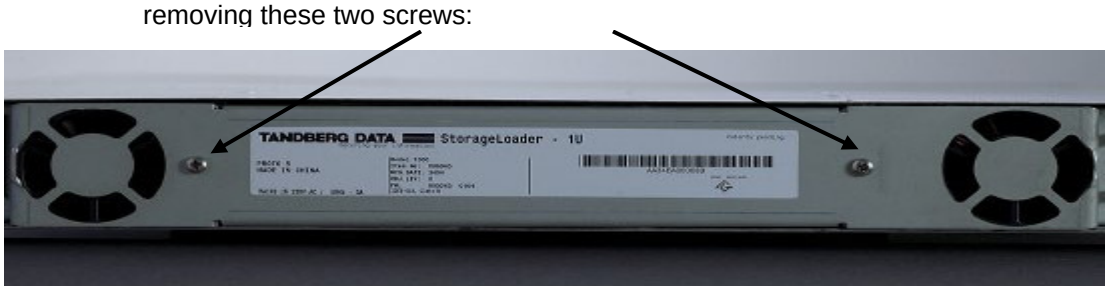


Figure 6.11 Exchanging a defective power supply

Figure 6.12 Removing the fixing screw

Remove the fixing screw (Figure 6.12). Withdraw the power-

supply and carefully unhook the connectors for power and fan (Figure 6.13) before completely removing the power-supply module.

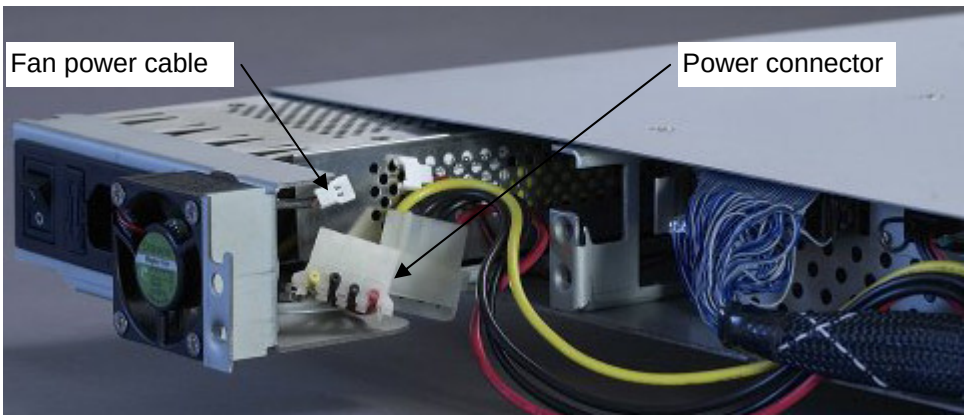


Figure 6.13 Fan power

After removing the power-supply, insert the replacement unit carefully the same way, reconnect the 2 cables, fasten the fixing screw and re-mount the back plate. Then pack the defective power supply in the same box you received the replacement power supply and return it to your support center.

6.5.4 FRU Fan

This FRU consists of the following parts:

S808740 Fan FRU StorageLoader 1U		
Item	**Description**	**Qty**
1	Fan	1
2	Quick Installation Guide Fan	1

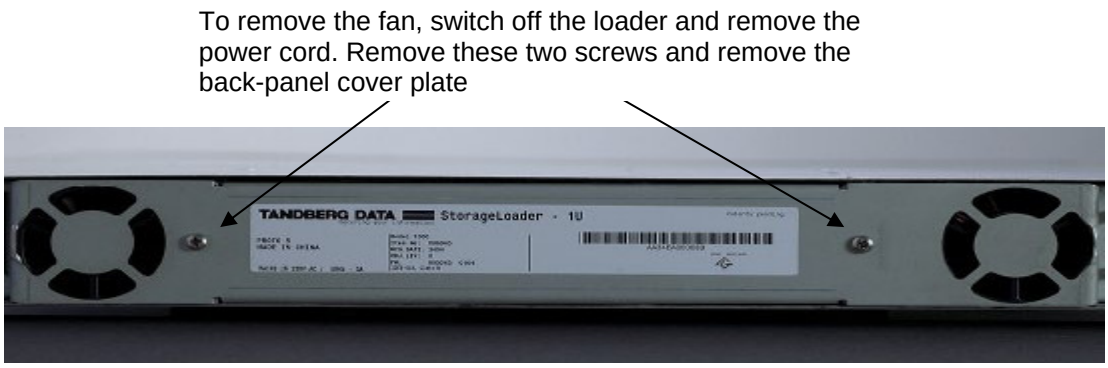
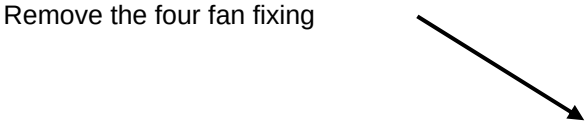

To remove the fan, switch off the loader and remove the power cord. Remove these two screws and remove the back-panel cover plate
TANDBERG DATA StorageLoader - 1U

Figure 6.14 Removing the back panel cover plate



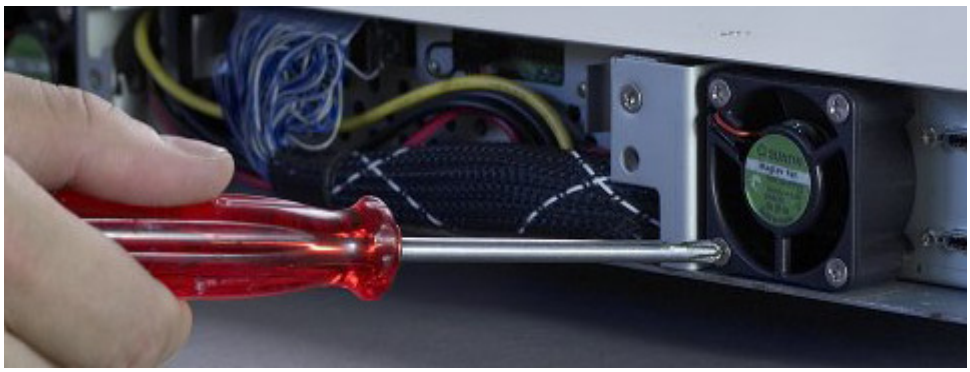


Figure 6.15 Removing the fan

Remove the fan fixing screws (Figure 6.15). Unhook the power connector of the fan and carefully replace it. When re-inserting the fan take care to have the cable in the notch in the chassis. If the cable is not fully inside the notch it can easily be damaged and cause a new faulty fan. Fasten the fan fixing screws.

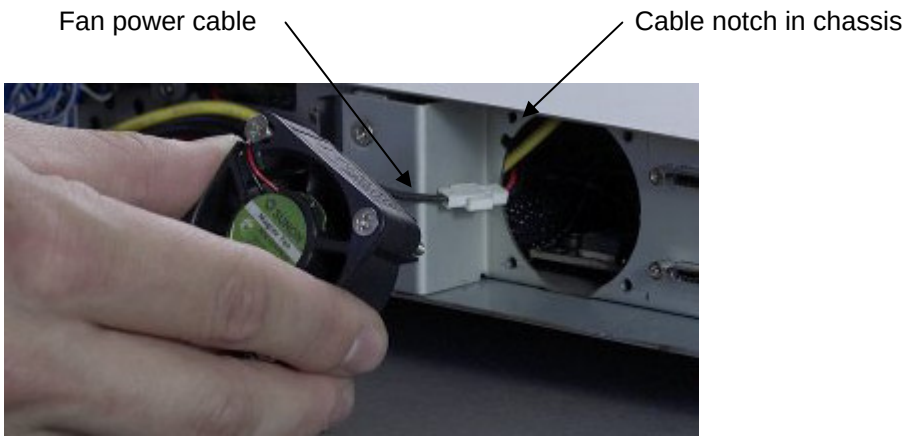


Figure 6.16 Notch in chassis for fan cable

After replacing a fan, pack the defective fan in the same box you received the replacement fan, and return it to your support center.

6.5.5 FRU Magazine

The FRU Magazine for the LTO version consists of the following parts:

LTO Magazine FRU StorageLoader 1U			
Item	**Part no**	**Description**	**Qty**
1	S808738	Magazine Left LTO	1
2	S808739	Magazine Right LTO	1

The FRU Magazine for the DLT version consists of the following parts:

DLT Magazine FRU StorageLoader 1U			
Item	**Part no**	**Description**	**Qty**
1	S808731	Magazine Left DLT	1
2	S808732	Magazine Right DLT	1

See section 4.8, Magazine Handling for instructions.

After replacing a magazine, pack the defective magazine in the same box you received the replacement magazine, and return it to your StorageLoader supplier.

6.5.6 FRU Filter

This FRU consists of the following parts:

S808741 Filter FRU StorageLoader 1U		
Item	**Description**	**Qty**
1	Filter	1
2	Quick Installation Guide Filter	1

When needed, the dust filter can be pulled out and a new one slid into the front-bezel assembly of the magazines. We recommend to replace the dust filters once every year.

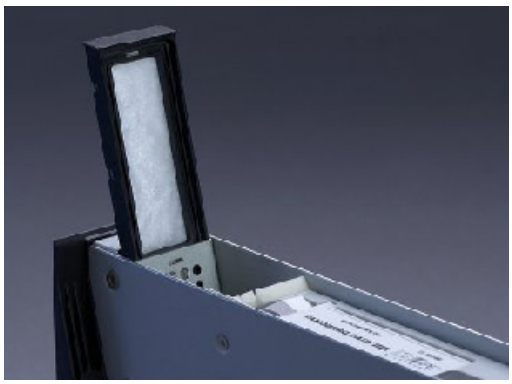


Figure 6.17 Replacing dust filter

7. Troubleshooting

7.1 How to Take Memory Dumps of the Loader

1. Log in to the remote management interface as Administrator.
2. Navigate to Maintenance → Debugging.
3. Click “Memory dump”.
4. Select “Save to disk” in the file download dialog box.
5. Use a zip utility to compress the downloaded memory image.
6. Send the zipped memory image as an email attachment to technical support.

Note that the memory image contains the passwords for the StorageLoader. If you do not want to compromise them, clear them first by changing them to nothing or some harmless value, see Settings Pages or

The Maintenance Menus.

7.2 How to Take Memory Dumps of the Drive

1. Log in to the remote management interface as Administrator.
2. Navigate to Maintenance → Debugging.
3. Click "Memory dump (drive)".
4. Select "Save to disk" in the file download dialog box.
5. Use a zip utility to compress the downloaded memory.
6. Send the zipped memory image as an email attachment to technical support.

7.3 Hardware checking

1. The autoloader uses one SCSI ID for the tape drive and one for the autoloader robotics. Verify that the loader SCSI ID and and the drive SCSI ID are set to unique SCSI IDs that are not used by any other SCSI device on the same bus. Depending

on other devices attached to the same SCSI bus and their SCSI IDs, you may need to change the SCSI ID of the tape drive or autolaoder before you can use the autoloader.

2. Verify that the system recognizes the tape drive and the loader during the boot process.
3. Verify that the SCSI host adapter recognizes the tape drive and the loader during its initialization.
4. Verify that the staus on the loader's front panel interface is OK.
5. Verify that the power cable is inserted correctly.
6. Verify that the SCSI cables are properly connected at both ends. Check that the cables are not damaged, and verify the lengths of your SCSI cabling. The length of the internal SCSI cabling inside the loader is 85cm. This length must be included in any calculation of cable length.
7. Verify that the SCSI bus is properly terminated. Only the devices physically at the beginning and end of the cable must be terminated.

7.4 Software checking

1. Verify that the operating system does not report a problem during the boot.
2. Verify that the driver for the SCSI host adapter is present and loaded properly.
3. Verify that the correct Drivers have been installed properly – if applicable.
4. Verify that the Backup software does not report any error messages when loading.
5. If any problem occurs, reinstall the Backup Application Software and check that both the loader and the tape drive are recognized.

7.5 Verifying Recent Changes

If the autoloader has been installed previously and operating correctly but is now incurring a problem, verify any recent changes to the system to ensure that these changes are not causing the problem. Try the following:

1. If the system configuration has changed: Remove the change to see if it affected the loader.
2. If an operating system corrective patch has been installed: Remove it to see if it affected the loader.
3. If a SCSI device has been added: Check for SCSI ID conflicts.
4. If a SCSI device has been added: Check if the SCSI termination has been properly set.

7.6 Trouble shooting matrix

The table below describes different problem situations and suggested actions to try to resolve the problem.

PROBLEM	SOLUTION
Power	
Autoloader does not power on	• Check the power cord connection. • Make sure the main power switch on the rear panel is in the ON position. • Make sure there is power to the outlet. Try another working outlet. • Replace the power cord. • Make sure that the fuse located beside the power connector on the rear panel is not blown. Replace fuse if blown (a spare fuse is located behind the fuse door). • Remove the back panel cover plate and verify that all cables are connected properly. • Replace the FRU power supply. • Contact your service representative.
The display is dead	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Verify that the fans starts at power on and then stops after a few seconds. • Check the power cord connection. • Make sure the main power switch on the rear panel is in the ON position. • Make sure there is power to the outlet. Try another working outlet. • Replace the power cord. • Make sure that the fuse located beside the power connector on the rear panel is not blown. Replace fuse if blown (a spare fuse is located behind the fuse door). • Remove the back panel cover plate and verify that all cables are connected properly. • Replace the FRU power supply. • Contact your service representative.

The front panel does not display information but the back light on the front panel is on	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Verify that the fans starts at power on and then stops after a few seconds. • Contact your service representative.
Cartridge movement	
Loader does not take inventory	• Make sure the transport screw is removed. • Make sure both magazines are in their locked position. • Look up the error code, follow the instructions in the “suggested action” column. • Contact your service representative.

Cartridge stucked in drive	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. Allow both the loader and the drive to complete initialization, which in rare cases can take as long as 10 minutes, and then retry unloading the tape using the autoloader operator panel controls. • Make sure that the backup software is not reserving the slot or preventing the tape drive from ejecting the cartridge. The backup software needs to cancel the reservation and any hold it has on the tape drive. • Temporarily disconnecting the autoloader from the host server system eliminates the host system and its software as a problem source. • Remove drive FRU from the drive bay. Connect power to the drive either by connecting it to the loader's power supply or to an external power supply. Try to eject the cartridge by pushing the drive's eject button. • Follow the drive's emergency eject procedure to remove the cartridge from the drive. • Replace the drive FRU. • Contact your service representative.
Cartridge stucked in magazine	• Remove the magazine using the front panel interface. Manually remove the cartridge from the magazine slot. • Contact your service representative.
Cartridge stucked in robotics	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Look up the error code, follow the instructions in the "suggested action" column. • Contact your service representative.
Failed to move cartridges	• Look up the error code (1101-1109, 1201-1209), follow the instructions in the "suggested action" column. • Contact your service representative.
Failed to insert cartridge into drive	Check failing media for pin damage (buckling pin). Hold the cartridge in your hand with the Write Protect Switch to your left and orientation arrow pointing from you. On the right side all the way in front is a small door that can be opened by sliding a door against you. Inside the cartridge you should see a metal pin, the pin shall be parallel with the cartridge front and is hold in place by to metal grippers at each end (top and bottom of the cartridge). The media should be attached to this pin, and you see only the top and bottom part of the pin. If the pin is missing, loose or damaged the tape will be damaged and rejected from the drive.
Media	
Media barcode labels	• Make sure the barcode labels are applied in the correct orientation on the cartridge. See user and installation guide chapter "Perfoming the installation", section "labeling of cartridges". • Make sure there are no wrinkles or damages on the label. • Make sure that StorageLoader specific labels are used. • If all of the above are OK, replace the label with a new one. • If problem continues, contact your service representative.

Data cartridge incompatible with drive	• Make sure you are using a data cartridges that is compatible with the drive. See the tape drive's reference manuals for details. • The SW backup application detects if an incompatible data cartridge is used, and communicates this to the user. • Remove the cartridge from the loader.
Cannot write to or read from tape	• Make sure that the cartridge is write enabled (move the write-protect switch to the enabled position). • Make sure that the cartridge has not been written using an incompatible format. • Make sure that the cartridge is an acceptable format for your drive type. See the tape drive's reference manuals for details. • Make sure that the cartridge has not been exposed to harsh environmental or electrical conditions and is not physically damaged in any way. • Many backup applications do not read or write to cartridges that were created using a different backup application. In this case, you may have to perform an erase, format, or label operation on the cartridge. • Make sure you understand any data protection or overwrite protection schemes that your backup application may be using, which could prevent you from writing to a given cartridge. • Retry the operation with a different, known good tape. • Clean the tape drive. See chapter "Maintenance" in the user and installation guide, section "using the cleaning cartridge".
SCSI problems	
Changed drive or loader SCSI ID, but the host server system does not recognize the new ID	• Make sure that all SCSI devices on the same bus have unique ID numbers. • If the SCSI bus is narrow (50-pin) only SCSI IDs 0 through 7 are available. • Make sure that you reboot the autoloader after changing the SCSI ID. • Reboot the host server system.
The tape drive responds on the SCSI bus to the host, but the loader does not respond	•Verify that a SCSI terminator is attached to both the last and first SCSI device on the SCSI bus. • Verify that the SCSI cables are connected to the rear of the loader. See chapter "Installation", section "connecting the SCSI bus cable". • Make sure that the correct host controller card is installed. • Verify that the SCSI cables are not damaged and that the total SCSI cable length is not exceeding the maximum required length. • Verify that the loader SCSI ID and the drive SCSI ID are set to unique SCSI IDs that is not used by any other SCSI device on the same bus. • Verify that the host application and the device drivers are installed with the most resent patches to support the loader • Reboot the loader by turning power off from the rear of the loader and then on. • Reboot the host system when the loader has completed it's power on sequence. • Contact your service representative.

The tape loader responds on the SCSI bus to the host, but the tape drive does not respond	• Verify that a SCSI terminator is attached to both the last and first SCSI device on the SCSI bus. • Verify that the SCSI cables are connected to the rear of the loader. See chapter “Installation”, section “connecting the SCSI bus cable”. • Make sure that the correct host controller card is installed. • Verify that the SCSI cables are not damaged and that the total SCSI cable length is not exceeding the maximum required length. • Verify that the loader SCSI ID and the drive SCSI ID are set to unique SCSI IDs that is not used by any other SCSI device on the same bus. • Verify that the host application and the device drivers are installed with the most resent patches to support the tape drive • Issue a system reset from the front panel or remote management • Remove the back panel cover plate on the loader and verify that the cables are properly connected to the drive. • Reboot the loader by turning power off from the rear of the loader and then on. • Reboot the host system when the loader has completed it’s power on sequence.. • Contact your service representative.
Autoloader Performance	
The autoloader is not efficiently backing up data	• Check the network bandwidth from the host system. If you are backing up data over a network, consider comparing to a local-only backup. • Make sure the autoloader and tape drive are on their own SCSI bus and not daisy-chained to another tape drive or to the hard drive being backed up. • Verify that the host application and the device drivers are installed with the most resent patches to support the tape drive and the loader. • Connect the autoloader to an LVD SCSI bus and make sure there are no SE devices on the same bus, because this causes the entire bus to negotiate down to SE speed. • Clean the tape drive. See the installation and user guide, chapter “Maintenance”, section “using the cleaning cartridge”. • Try a new cartridge. A marginal cartridge can cause performance problems due to bad spots on the tape requiring retries. • Backing up compressed data lowers performance. • Check the size of the files. Small file size can impact performance.
Cleaning	
Cannot load the cleaning Cartridge	• Make sure there is no cartridge present in the drive before you load a cleaning cartridge. • Make sure the cleaning cartridge is not expired. • Contact your service representative.

Write or read issues	
Contaminated head	Avoid contamination by ensuring that the autoloader is installed in a clean, contamination-free environment. Cartridges should be stored vertically in their plastic cases. Continue cleaning the tape drive as needed. If a cleaning cartridge is not successful in resolving the problem after 3 or more attempts, the cleaning cartridge may be contaminated and should not be used in another drive.
Non-acclimated media	A cartridge should be acclimated for at least 24 hours before being used, particularly if it has been stored at a substantially different temperature or level of humidity than the autoloader.
Cleaning cartridge is Incompatible	Make sure you are using an allowed cleaning cartridges
Expired cleaning cartridge	Verify the number of cleanings per cleaning tape for your media type
Bad/defective/contaminated media	• If the write/read errors persist and the drive has been cleaned, that cartridge should be suspected as being defective, if it is not an invalid cleaning cartridge. • If this occurs, export the cartridge and load a known good cartridge. In some cases, a cartridge can be worn out, have a defective cartridge memory, or have been formatted as a Firmware Upgrade Tape. • Any cartridge that is suspected of being defective or contaminated should NOT be reused in any drive.
LED error messages	
Amber LED on	• When the amber LED is on, the loader has encountered an electrical or mechanical failure. An error message shall be dispalyed on the front panel (and RMI). Refer to the error codes for details.
Errors Displayed on Front Panel	
There is an error code on the LCD display	• Look up the error code, try to resolve the failure. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Contact your service representative.
There is an error code on the RMI	• Look up the error code, try to resolve the failure. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Contact your service representative.
Remote Management	
The unit does not respond on the RMI	• Verify that the Ethernet cable is connected to the correct hub • Verify the Ethernet settings via the front panel. See user and installation guide, chapter “Remote management” for details. • Reboot the loader by issuing a system reset. Wait at least 30 seconds for the RMI to initialize. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. Wait at least 30 seconds for the RMI to initialize. • Contact your service representative.
Forgot password	
Forgot password on RMI	• The RMI password can be cleared from the front panel interface. See the user and installation guide for details (see figure “The complete menu tree”).

Forgot password on FPI	• Look up the RMI IP address from the front panel menu (view data menu). • Connect the RMI interface and perform a memory dump of the loader (see user and installation guide for details). • Send the memdump to your Service representative. The FPI password can be decoded from the memdump by using a special SW.

7.7 The Error Screen

When the StorageLoader detects an error condition, the red/amber Fault LED is illuminated and one of the error screens appears on the front panel. Figure 7.1 illustrates how the StorageLoader reports error conditions on the front panel display:

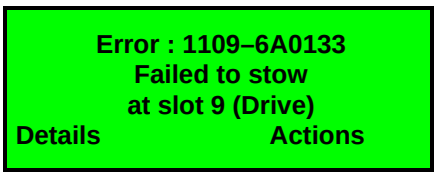


Figure 7.1 Error Code Page

The top line shows an Error code in the following format: XXXX-YYRRVV
The XXXX is the error number, while the YY is the internal loader error code. The RRVV is the FW revision numbers, where RR is the major revision and VV is the minor revision.

The next two lines give more detailed error information. There are two option buttons, “Details” and “Actions”. Pressing the Details button gives access to a multi-page error description text. Pressing Action gives access to a set of actions that can be taken to recover from the error. An example of pressing “Details” and continuing with pressing “More” is shown in figures 7.2 and 7.3.

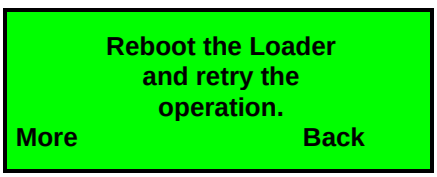


Figure 7.2 Example of detailed information

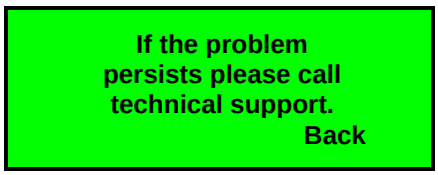


Figure 7.3 Example of further detailed information

In this example, pressing “Back” twice takes you back to the Error Code Page (figure 7.1) where you can press “Actions” to go to the Actions menu. Figure 7.4 shows an example of pressing “Actions”. Pressing the buttons next to the up/down arrows on the screen gives you access to other action options.

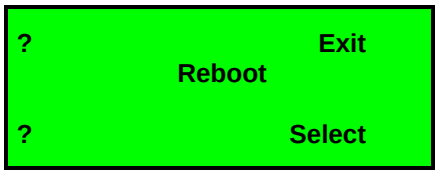


Figure 7.4 Example of action

In figure 7.4, you have been prompted to reboot the Loader. Pressing “Select” will result in the warning message shown in figure 7.5. Press “Ok” to execute the reboot.

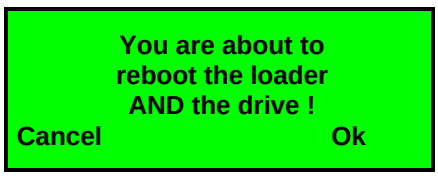


Figure 7.5 Warning message concerning reboot

When an error condition occurs, identify the problem using the displayed error codes and follow the suggested actions. The error codes are listed in the next section.

7.8 Error Codes

The error codes are listed in numerical sequence by their Fault Symptom Code (FSC) in the tables that follow. If a persistent error condition prompts you to call your Technical Support representative, be sure to supply the code information to help identify the problem.

Error Code	Display Message	Description	Suggested Action	Most likely cause (for guidance only)
01ZZ	Diagnostic number ZZ failed.	The diagnostics number ZZ failed.	Reboot the loader and retry the operation.	(This error code is reserved for future use)
0200	Initialization of the robotics failed.	The robotics failed to complete the calibration or the inventory sequence.	1. Reboot the loader and retry the operation. 2. Verify that the magazines are locked. 3. Turn off the loader and try to remove the magazines by using the emergency eject pin. 4. Contact your service representative.	Cartridge blocked, faulty robotics
1001	Failed moving the robotics.	The robotics was not able to move.	Reboot the loader and retry the operation.	Cartridge blocked, faulty robotics
1101-1108	Failed to stow at slot 01 .. 08	The robotics is not able to stow the cartridge to the magazine	1. Reboot the loader and retry the operation. 2. Remove the magazine if possible. Remove all cartridges. 3. Verify that the cartridge is not damaged. 4. Insert empty magazines. 5. Power cycle the loader. 6. Retry the operation. 7. Retry the operation with a new magazine.	Defect robotics, defect magazine, defect cartridge
1109	Failed to stow at slot 09	Failed to insert cartridge in drive	1. Reboot the loader and retry the operation. 2. If failure persists, insert the cartridge into a magazine slot, remove the magazine and verify that the cartridge is not damaged.	
1201 - 1208	Failed to fetch at slot 01 .. 08	The robotics is not able to fetch the requested cartridge from the magazine	1. Reboot the loader and retry the operation. 2. Remove the magazine if possible. Remove all cartridges. 3. Verify that the cartridge is not damaged. 4. Insert empty magazines. 5. Power cycle the loader. 6. Retry the operation. 7. Retry the operation with a new magazine	Defect robotics, defect magazine, defect cartridge

1209	Failed to fetch at slot 09	Failed to eject cartridge from drive	1. Reboot the loader and retry the operation. 2. Try to eject the cartridge from the drive via the front panel menu. 3.Remove the drive FRU. Connect power to drive and push the drive's eject button. If this fails, remove cartidge by following the drive's emergency eject procedure.	Defect drive or robotics. Defect cartridge.
2000	Drive not found	Communication error between the loader and the drive.	1. Reboot the loader and retry the operation. 2. Remove back-panel cover plate and check the SCSI cabling and the ADI cabling.	SCSI and signal cables, power cables; defective power supply; defective drive.
2001	Drive hardware fault detected.	The drive has reported a hardware fault.	Reboot the loader and retry the operation. If the problem persists replace the drive.	Defective drive

Appendix A – Specifications

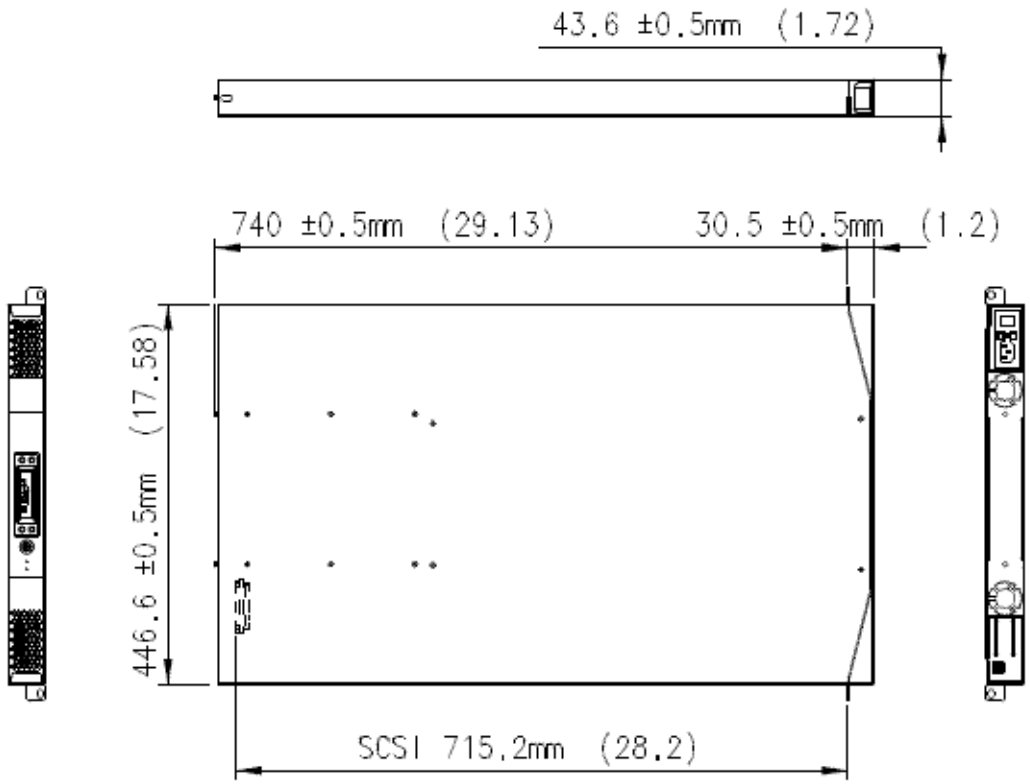
A.1 Mechanical Dimensions and Weight

The Tandberg Data StorageLoader 1U is designed as a rack mount unit. The StorageLoader can also be used as a tabletop unit.

Dimensions:

Length	740 mm (29.13 in) ±0.5 mm from front rail to rear of unit
Width	446.6 mm (17.58 in) ±0.5 mm
Height	43.6 (1.72 in) ±0.5 mm
Weight	14.6 kg (32.2 lb) without cartridges

Table A - 1 StorageLoader Mechanical Dimensions and Weight



A.2 Power Requirements

Normal AC version.

Input voltage	90 VAC – 264VAC
Input Frequency	47 Hz – 63 Hz
Inrush Current (Cold Start)	Less than 30 A, 115VAC Less than 60 A, 230 VAC
Power consumption average	35W
Power consumption peak*	70W*

* Maximum peak length, less than 10ms

Table A - 2 StorageLoader Power Requirements

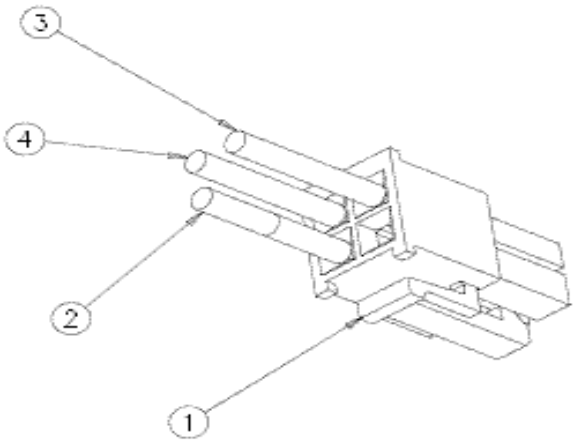
Special DC version.

Power Ratings	**-48 VDC +/- 20 %** **1.5 A**

Notification. Ref. UL60950-1:

Sub-clause reference from IEC 60950-1	Requirement	Example of English text for marking/ instruction	Example of French text for marking/instruction	
3.2.1.2	Equipment with provisions to connect the earthed conductor of a d.c. supply circuit: Equipment which has provisions to connect the earthed conductor of a d.c. supply circuit to the earthing conductor at the equipment shall be provided with a permanent marking located near and in plain view of the field wiring terminals and worded as indicated. Alternatively, the wording can be replaced by the ⏚ symbol on the product if the specified wording appears in the installation instructions.	This equipment is designed to permit the connection of the earthed conductor of the d.c. supply circuit to the earthing conductor at the equipment. If this connection is made, all of the following conditions must be met: – This equipment shall be connected directly to the d.c. supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the d.c. supply system earthing electrode conductor is connected. – This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same d.c. supply circuit and the earthing conductor, and also the point of earthing of the d.c. system. The d.c. system shall not be earthed elsewhere. – The d.c. supply source shall be located within the same premises as this equipment. – Switching or disconnecting devices shall not be in the earthed circuit conductor between the d.c. source and the point of connection of the earthing electrode conductor.	Cet appareil est conçu pour permettre le raccordement du conducteur relié à la terre du circuit d'alimentation c.c. au conducteur de terre de l'appareil. Pour ce raccordement, toutes les conditions suivantes doivent être respectées: - Ce matériel doit être raccordé directement au conducteur de la prise de terre du circuit d'alimentation c.c. ou à une tresse de mise à la masse reliée à une barre omnibus de terre laquelle est raccordée à l'électrode de terre du circuit d'alimentation c.c. - Les appareils dont les conducteurs de terre respectifs sont raccordés au conducteur de terre du même circuit d'alimentation c.c. doivent être installés à proximité les uns des autres (p.ex., dans des armoires adjacentes) et à proximité de la prise de terre du circuit d'alimentation c.c. Le circuit d'alimentation c.c. ne doit comporter aucune autre prise de terre. – La source d'alimentation du circuit c.c. doit être située dans la même pièce que le matériel. - Il ne doit y avoir aucun dispositif de commutation ou de sectionnement entre le point de raccordement au conducteur de la source d'alimentation c.c. et le point de raccordement à la prise de terre.	D2

Special DC connector:



Item	Qty	Name	Part #	Ind	Dwg #	Rev	Material
4	1	Cable -48V					
3	1	Cable 0V					
2	1	Cable Grounding					
1	1	Connector 48V Molex 3901-2045	039012045				

QUALITY LEVEL (PPM) ACCORDING TO PURCHASE AGREEMENT	Drawing Size: A4	Marking of change since last revision				Parent Assembly: 870586	Project no.: 2250
Europ. proj. / First ang. proj.	Units: mm	Scale: 2:1	Very important: A-X (Xx)				
			Gen. tolerance: ± ±°	10.Feb.06	JABA	LUGE	Replacement for: New
			Unspecified tolerances ISO 965-2 - ISO 2768 Fine series	Date	Designed By	Approved By	Sheet-of

Material	Part name: Connector Outside Assy	Part No.: 870614	Index
Surface	Location (Internet Use Only): ROBOTICS LOADER	Drawing No.: 870614	Rev. No.: A
Unless otherwise stated, the dimensions are without surface coating	TANDBERG DATA		

A.3 Vibration Specifications

Sinusoidal sweep			
Sweep Rates	1 octave/minute		
Axes	X, Y and Z		
Duration	2 hours		
	Frequency Range (Hz)		Level
Operating	5	24.2	0.01 in p-p
	24.2	500	0.3g
Non-Operating (Storage)	5	27.1	0.02 in p-p
	27.1	500	0.75g
Transport	5	200	0.5g

Table A - 3 StorageLoader sine sweep levels

Random		
Crest factor	3	
Axes	X, Y, Z	
Duration	30 min/axis	
	Frequency (Hz)	Level (g^2/Hz)
Operating	5	2.0E-5
	17	3.0E-4
	150	3.0E-4
	200	8.0E-5
	500	8.0E-5
Total	$0.27g_{rms}$	
Non Operating/Storage	5	2.3E-3
	500	2.3E-3
Total	$1.07g_{rms}$	
Transport	5	0.03
	8	0.03
	40	0.003
	45	0.01
	70	0.01
	200	0.001
Total level	$1.03g_{rms}$	

Table A - 4 StorageLoader random vibration levels

A.4 Mechanical Shock Specifications

Mechanical Bump/Shock				
Axes	X, Y, Z			
Directions	Positive and negative			
Pulse interval	3 seconds			
	Pulse shape	Pulse duration	Pulse Level	Pulses/axis/direction
Operating	Half sine	5ms	3g	1000
Storage (X,Z)	Half sine	8ms	20g	3
Storage (Y)	Half sine	8ms	15g	3

Table A - 5 StorageLoader mechanical shock levels

A.5 Drop

Drop test	
Standard	ASTM D-4169
Drop sequence	10 drops, 1 corner, 3 edges, 6 faces
Drop height	30 inches

Table A - 6 StorageLoader drop test

A.6 Climatic Specifications

Temperature		
Operating	Range	+10°C to +35°C
	Gradient	10°C/hour
Non-Operating	Range	-35°C to +60°C
	Gradient	20°C/hour

Table A - 7 StorageLoader temperature specification

Installing the equipment in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient.

Humidity		
Operating	Range	20%Rh to 80%Rh
	Gradient	10%Rh/hour
Non-Operating	Range	10%Rh to 90%Rh
	Gradient	20%Rh /hour

Table A - 8 StorageLoader humidity specification

Altitude		
Operating	Range	-500 to 10000 ft
Non-Operating	Range	-500 to 40000 ft

Table A - 9 StorageLoader altitude specification

A.7 Noise Specification

Acoustic	
Idle (L_wA)	60 dBA
Operating (L_wA)	65 dBA

Table A - 10 StorageLoader noise specification

A.8 Product Reliability

MTBF: 250.000 hours for StorageLoader electronics

MSBF: 500.000 Mean cartridge swaps between failures

Appendix B – Spare parts/Accessories

Type	Description	P/N
Spare parts	FRU drive tray assy 220LTO	007171
	FRU drive tray assy 420LTO	006979
	FRU drive tray assy VS160	006978
	Magazine Left LTO	S808738
	Magazine Right LTO	S808739
	Magazine Left DLT	S808731
	Magazine Right DLT	S808732
	FRU Fan	S808740
	FRU Power Supply	S808696
	FRU Filter	S808741
	Rackmount Rail Kit 1U	S808703

Type	Description	P/N
Accessories	Accessory kit DLT	800246
	Accessory kit LTO	870157
	Quick Installation Guide	433060

Table B - 1 List of spare parts and accessories